

COMPUTER GENERATION OF CHINESE CHARACTERS  
USING RADICALS

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## ABSTRACT

### COMPUTER GENERATION OF CHINESE CHARACTERS USING RADICALS

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The objective of this thesis is to develop a scheme to generate Chinese characters using the standard English keyboard.

In order to reconstruct the Chinese characters using a computer, it is necessary to establish certain composition rules for the computer to follow. A structural analysis of the Chinese characters will lead to a set of composition rules. This thesis attempts to use fifteen composition rules and two formatting codes which are considered sufficient to construct the 4864 most frequently used Chinese characters using twenty-eight groups of radicals as defined in Appendix 1.

This scheme consists of INITIALIZATION, COMMAND INPUT, COMMAND DECODING and CHARACTER GENERATION. It can be implemented on the CDC CYBER 170 computer with a Tektronix graphics system or a PRINTRONIX plotter at Concordia University and the software is coded in PASCAL language.

The software has been tested with the 4864 most frequently used Chinese characters with success. It is flexible and can be expanded to include any Chinese characters by redefining some new radicals. It is capable of forming an intermediate character whenever required since parentheses are recognized by the system to set up the priority of the processing sequence of composition rules.

Some statistics (the frequency distribution of radicals, the time required to search for radicals, the total computer time to generate the 4864 characters and the 753,941 samples for the vocabulary of 4864 characters, the frequency of computer rule usage, identification of those characters containing the same number of radicals, and the frequency of the radical's position and of its percentage) are presented and discussed.

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## CHAPTER I

### INTRODUCTION

The first digital computer, called Mark I, was built in 1944 by a Harvard University professor, Howard Aiken. The first electronic digital computer using vacuum tubes, called ENIAC, was built at the University of Pennsylvania in 1946. The mass production of computers commenced in the early 1950's [20]. Since then the industry has grown steadily but with a quantum jump when the transistors were used to replace vacuum tubes and the integrated circuits to replace discrete transistor components. The improvement of computer technology has been enhanced even further by the introduction of large and very large scale integrated circuits.

While the development of this technology is taking place in western countries, very little development has been done in other countries except Japan until the 1970's. The development of Chinese computers received some attention in the 1970's. However, their progress is rather slow because of the limited amount of resources that can be devoted to

them and the inherent difficulties in data processing using Chinese characters.

Chinese and English are entirely different languages in terms of their origin and character presentation. English words can be derived from an alphabet of twenty-six letters. These letters are placed side by side. Therefore to design the input system is rather simple, because the number of keys can be very limited. On the other hand, Chinese characters do not have a unique way of construction. As a result, the system to input Chinese characters into a computer can hardly be standardized. Chinese keyboards exist with more than 100 keys, with 60 to 100 keys, or with less than 60 keys [2]. The effort for an operator to operate a Chinese keyboard depends to a large extent on the design of the Chinese keyboard.

The processing of English and Chinese characters is also different. Since every letter can be assigned a unique code, the manipulation of the English character is essentially translated into the manipulation of these codes in the memory. As it has been mentioned earlier, these codes are one-dimensional, left and right. On the other hand, it is difficult to assign to a Chinese radical a code which is acceptable as standard. In addition, the number of radicals can only be fixed after the industry has agreed on a basic set of Chinese characters to be included in the

Chinese computer. The establishment of the standard requires a joint effort of the different countries which are involved in the development of Chinese computers. One other complication of processing Chinese characters is that the manipulation of radicals is no longer limited to one dimension.

The output process is similar to the input process. Basically one has to translate the codes in the memory into a character which is then displayed or printed by an output device. In the case of English, since each letter either capital or minor has its own code, the output of English character is the translation of this code into a displayed character. On the other hand, the output of Chinese characters depends on the scheme of character generation.

There are different ways of generating Chinese characters in computer systems. They include the fixed position method, the telegram code method, the JU In Fu Hau method, the 4-corner code method, the 3-corner code method, and the radical method. Basically, the Chinese character output device can be of three types: the impact type, non-impact type such as thermoprinter, ink jet printer, and the matrix type or CRT. This thesis attempts to develop a scheme to combine the radicals internally and in a computer system such that the generated characters can be displayed on a graphics terminal, a matrix printer, or a PRINTRONIX



plotter.

In chapter II, the current literature relating to Chinese data processing will be briefly discussed. In chapter III, a scheme, which is the result of this research, will be presented along with various examples and methods of implementation. In chapter IV, some statistics (the frequency distribution of radicals, the time required to search for radicals, the total computer time to generate the 4864 most frequently used Chinese characters based on 753,941 samples [15,18], the frequency of composition rule usage, and the number of radicals in a character) will be presented and discussed. The conclusion of this research will be drawn from the results in chapter V. Some of the contents of the file used to create Chinese characters are presented in Appendices 3 & 4.

## CHAPTER II

### REVIEW OF THE LITERATURE RELATED TO

### CHINESE DATA PROCESSING

#### II.1 Introduction

In chapter I, we have discussed the difficulties encountered in Chinese data processing. In inputting Chinese characters, there are no limited radicals which can be acceptably standardized. Although there exists some systems with phonetic or Chinese keyboards, too many characters with the same sound or codes slow down the computer speed. In processing Chinese characters, the structure of Chinese characters is two-dimensional and a large number of Chinese characters prevents easy assignment of a unique code for each character. The difficulties encountered in the output process is similar to that of the

input process. This chapter will review different methods of generating Chinese characters and some applications in Chinese data processing.

## II.2 Different Methods of Generating Chinese Characters

There are six methods to generate Chinese characters through phonetic or Chinese Keyboard : the fixed position method, the telegram code method, the Ju In Fu Hau method, the 4-corner code method, the 3-corner code method, and the radical method. They will be discussed in the following paragraphs.

### (1) Fixed position method :

This method places the Chinese characters in several different areas of the keyboard [2], according to their frequency of usage : often used, sometimes used, rarely used. Every character has a fixed position. The operator needs to look for those positions one by one and he/she needs to memorize the position of each character.

This method was created by Kao Chung-Chin (高仲芹) and was adopted by two Japanese companies, Fuji Co. and Jaho Intelligence machine Association (富士通及昭和情報機器會社) to develop Chinese

typewriters. This method was first applied only to typewriters. The first one to have applied the method to the computer is Yeh Chen-Hui (葉晨暉) [2].

The usefulness of this system comes from the fact that it is based on the Chinese typewriter, in such a way that there are almost ten thousand qualified personnel [2] who could operate this system. However because of its specially designed key-board, the price of production is very high and additional operators need a specialized training.

(2.) Telegram code method :

This method uses the standard codes published by the Taiwan Ministry of Communication [2]. Using initially the numbers 0001 to 9999, altogether there were about 10,000 words. Recently this number has been increased to about 12,000.

The advantage of this method is that each character has a unique code, so that there is no confusion. But the method requires memorization, and three to nine months of training are necessary to enable the operator to operate efficiently [2].

(3) Ju In Fu Hau method (注音符號) :

This method is based on the Chinese pronunciation system as input code. The method can be implemented by adding special function keys to a standard keyboard.

The advantage of this method is that everyone knows the pronunciation system. But there are many words with the same sound or several pronunciations for the same word. For example, the sound of "-\ " represents more than 90 words. Five of them are "亦", "佚", "億", "役", and "易". This problem is a big drawback for this input technique [2,11]. The solution is to present all the words with the same sound on the screen at the same time to enable the operator to choose the right one. Theoretically, this method is very practical. However, because each individual has a different accent, and different regions have local dialects, it is often still necessary to describe to the operator the written form of that character.

#### (4) 4-corner code method :

This method was created by Wong Yun-Wu (王雲五). The method uses ten numbers to represent twenty-nine kinds of strokes [2,11]. Each character is divided into four corners, and a code is assigned to each of those four corners. In each corner, the strokes are represented by their codes. This method was originally designed for dictionaries. When applying it to input Chinese words into

a computer, some problems arise because there are too many different words with the same code. A new method created by Chou Chun-Liang (周俊良) combined this method and the Ju In Fu Hau method [2]. This combination makes it possible to reduce significantly the repetitions of words but increases the number of input codes. In addition, the problem of the correct pronunciation is still an unsolved technical problem.

(5). 3-corner code method :

This method was created by Huang Kao-Tung (黃克東). Each word was decomposed into three parts, following the sequence of the pattern of the English letter "Z". The strokes corresponding to each part are represented by a two-number code (00 to 99). Thus, a word can be represented by 6 numbers. The rate of repetition was about 3 % [2].

The method was used by a computer and several computer companies in Taiwan used it too. The reason why this method could not be used widely is that the partition of a word into three parts is quite contrary to the principles of traditional Chinese writing. In addition, the decomposition rules used in a computer were complicated and ambiguous. An operator needs a special training.

(6) Radical method :

One project employing this method was created by I.B.M. and was supported by the American Air Force Research and Development Department. The project involved a investment of U.S.\$65,000,000. IBM's project ended in 1970, but the idea brought about a continuous research by Chinese scientists [2,7,8,10,22,23].

In chapter III, we will analyze the structure of Chinese characters and deduce fifteen composition rules from it. Also a scheme to generate Chinese characters from radicals and implementation of this scheme in computer will be presented.

### II.3 Applications

Some applications in Chinese data processing will be briefly reviewed.

---

#### Chinese Information Processing System

A Chinese character Information Processing System could process Chinese character information and retrieve data in Chinese [14].

#### Chinese Database Systems

A automatic land value data base system had the functions of on-line inquiry, land area calculation, land value calculation and editing the land cards [4]. This system was classified by land number, land value records which were classified by name, and owner's records.

A relational Chinese medical database system contained information about Chinese drugs and their prescriptions for various diseases [3]. Eleven subprograms were included in the working routines to create, update, copy, and list information.

#### Chinese Text Processing

A software package handling Chinese text editing and file management was implemented at Chung-Yuan University in Taiwan [9]. Chinese file names and Chinese directives were used. The editor, part of the software package, could insert, delete, replace, or modify the text by replacing character strings of the same pattern through the file.

#### Chinese Programming Language

A Chinese programming language for business data processing, Chinese Micro-cobol, was designed for



microprocessor systems [5]. It was created from a subset of Cobol. It was simple to learn but adequate for business data processing.

### Chinese Speech Recognition

A microprocessor-based design of speech analysis and synthesis system were applied to Chinese data processing [12]. The voice of man and woman could be distinguished, but the speaker could not be identified.

### Teaching Chinese in a Computer

A computer system could teach the pronunciations [16,17], meanings, and the written form of characters, as well as how to write them [6,13].

## CHAPTER III

### A SCHEME FOR GENERATING CHINESE CHARACTERS

#### III.1 Introduction.

In chapter I, we have discussed the difficulties encountered in generating Chinese characters by a computer. In chapter II, we have briefly reviewed different methods for generating Chinese characters described in the existing literature and some applications related to Chinese data processing. The idea underlying the radical method comes from the principle of the Chinese dictionary. It is easy for a person to look up a pattern in a Chinese dictionary. Therefore, this method does not require a specialized training for the operators. In order to reconstruct the Chinese characters using a computer, it is necessary to establish certain composition rules for the computer to

follow [1]. Although one can always try to consider as many rules as possible, it is sometimes not practical to incorporate all of them in software, due to the limitation of the computing facilities such as CPU processing power and memory size.

This thesis attempts to develop a scheme based on a limited number of composition rules which are adequate to generate the 4864 most frequently used Chinese characters.

In section III.2, a structural analysis of the Chinese characters will be presented. This analysis will lead to a set of composition rules. In section III.3, the composition rules which are considered necessary to generate Chinese characters will be described. In section III.4 the assignment of codes to each character within the 4864 characters and the approach to design the radicals will be presented. In section III.5, the development of the software system will be described.

### III.2 Structural Analysis

Chinese characters can be composed from radicals. These radicals of different sizes have to be placed in specific positions with respect to each other to make a character. Depending on how radicals are chosen, codes of

different levels of complexity are required to generate a character using the pre-defined radicals. Our analysis of the structure of Chinese characters reveals that there are more than 75 different combinations of relative position of radicals and their sizes can be deduced. A sample list of the character structures is analyzed in order that the total number of basic radicals contained in the characters of Chinese dictionaries can be limited to at most 4 when represented in this system. The result is given in Appendix 2. Since one can pre-define a radical of any complexity, it is possible to limit the number of methods of putting radicals together. The analysis indicates that if one uses twenty-eight categories of radicals, each containing a group of radicals having the same number of strokes, then fifteen composition rules will be sufficient to generate almost all the Chinese characters since one can always add radicals into one of the twenty-eight groups.

The 687 radicals of the twenty-eight categories used in this thesis are presented in FIG. 3-1. Some of them are chosen from references [7] and [22]. The 687 radicals are selected in such a way that each character in the 4864 characters contains at most 4 radicals.

0001 0016 0031 0046 0061 0076 0091 0106 0121 0136

一	十	厶	丁	乂	大	三	乚	刃	于
、	一	、	4	力	士	卜	亡	井	口
冂	川	冂	コ	口	彳	注	彳	川	不
フ	匕	八	巳	、	夕	尸	丸	巳	丈
一	人	几	乂	口	小	≡	才	彡	刃
、	力	刀	匚	寸	广	牙	示	少	巳
乙	、	下	古	山	山	巳	干	凡	尤
一	人	又	入	女	工	千	巳	立	又
匕	了	卜	、	才	玄	《	川	大	少
一	上	厂	厂	△	口	下	又	久	日
、	儿	夕	与	也	巾	巾	弋	凡	木
匕	又	九	山	尸	士	冂	乃	长	月
、	三	八	万	井	立	己	弋	ヨ	、
イ	人	七	几	子	上	之	业	ヨ	王
勾	冂	卜	亡	夕	弓	丰	大	内	文

0151 0166 0181 0196 0211 0226 0241 0256 0271 0286

心	爪	才	夬	矛	束	双	去	正	电
戈	户	丰	文	丰	井	弔	生	尔	平
方	老	少	口	尹	办	土	用	民	非
不	尤	片	比	支	礼	乚	母	且	句
受	五	云	世	玄	丹	白	戌	皮	包
衣	止	六	田	毛	互	禾	业	永	央
口	犬	与	斗	夭	小	正	以	旦	吕
斤	开	勿	太	止	爪	立	乍	冉	必
主	欠	夫	氏	氏	宀	田	四	衤	牙
中	甘	立	歹	产	元	古	弔	本	夷
巴	水	父	止	牛	夬	目	矢	由	冰
火	戈	气	尹	屯	尸	可	穴	主	未
川	亢	反	肉	从	支	古	皿	韭	半
天	手	及	介	尺	毛	示	石	疒	虫
牛	分		日	小	丐	回	册	片	

0301 0316 0331 0346 0361 0376 0391 0406 0421 0436

丙只甘内矛申艮丘艸木正卯甲戌巨  
乎左无斥另史瓦玉册父圭田凶友事  
丰末正步互水凹勿巾吞甩北糸竹在  
西至圭自艮四米虫聿交回卢耳白共  
曲豕行自而衣羽亥先苹来公叩舟羊  
吏圭田戈向光耳外缶死州兆亦夫  
弗亘共肉良竹束朱六未罔含瓜蜀丞  
耒逆夷彘曳鳥缶百旭言我貝車里  
見豆豕足那走辛更身臣求采告酉  
甫谷辰走角亞束良鳥坐众問克呂兩

0451	0466	0481	0496	0511	0526	0541	0556	0571	0586
皂	凸	取	炒	亮	重	果	罌	既	衰
赤	巫	東	免	齊	馬	革	風	鬥	蚤
吳	呆	車	具	某	爲	復	鸛	兼	鬼
田	尸	事	帚	苗	尙	宀	忒	烏	鹵
豸	更	兩	夜	免	看	俞	林	冢	或
矣	克	林	亟	凶	面	垂	能	雀	從
曼	門	幸	武	圭	南	曷	幾	弱	畱
亨	佳	奎	耳	臣	易	段	高	岑	魚
旱	者	非	舍	函	食	甚	骨	晉	與
雨	金	食	耳	乖	品	音	隻	盟	繼
串	來	直	若	豕	東	段	韋	罌	萬
卯	尚	車	承	重	豈	禺	鬼	雀	聲
兔	雨	無	孟	秉	是	卑	离	魚	鳥
正	其	制	伯	而	飛	拜	乘	鼎	產
	長		典	頁	風	橐	韋	重	婁



0601	0616	0631	0646	0661	0676
帶	黃	林	雨	茲	興
鹵	忠	壹	齊	晶	藏
寅	區	堯	醫	龍	繭
董	堯	齊	寧	褒	縉
曹	喜	赫	厭	茁	麗
圭	京	與	賓	燕	瓊
率	喬	僉	昂	龜	澀
鹿	莫	卿	肅	義	競
麥	商	歲	壽	桤	與
哀	業	甦	嘉	畱	屬
牽	尋	貢	鉗	薈	囂
管	喪	高	憑	襄	靈
兜	隋	鼠	裏	寔	
彪	爽	鼎	寫	爵	
黑	卒	臺	慶	命	

### III.3 Composition Rules

The following fifteen composition rules form the principal part of the scheme for generating Chinese characters. The operation code for each composition rule is chosen such that the symbol resembles the relative positions and sizes of two radicals. In the following, each composition rule will be described with examples.

#### Composition rule (1)

Two radicals of equal size are placed side by side. Symbolically, the character is represented by 

1st	2nd
-----	-----

 with the first radical on the left and the second one on the right. The operation code for this rule is " " which signifies that the first and second radicals are of the same size. The application of this rule can be demonstrated as follows : The radical "故" can be constructed by two radicals "古" and "攴" by applying this rule. Similarly, the character "政" is composed of two radicals "正" and "攴" respectively.

#### Composition rule (2)

Two radicals of different sizes are placed side by side. Symbolically, the character is represented by 

1st	2nd
-----	-----

 with the second radical on the right twice as

wide as the first one on the left. The operation code for this rule is '<' which signifies the second radical is wider than the first one. The application of this rule can be demonstrated as follows : The character "使" can be constructed by two radicals "亻" and "吏" by applying this rule. Similarly, the character "凍" is composed of two radicals "冫" and "東" respectively.

### \* Composition rule (3)

This rule is similar to Composition rule (2) except that the first radical is wider than the second one. Symbolically, the character is represented by 

1st	2nd
-----	-----

 with the first radical on the left twice as wide as the second one on the right. The operation code for this rule is '>' which signifies the first radical is wider than the second one. The application of this rule can be demonstrated as follows : The character "夕" can be constructed by two radicals "夕" and "卜" by applying this rule. Similarly, the character "判" is composed of two radicals "半" and "刂" respectively.

### Composition rule (4)

The second radical is placed immediately below the first one. Symbolically, the character is represented by

1st
2nd

. The operation code for this rule is ';' which

signifies the first and the second radicals have the same sizes. The application of this rule can be demonstrated as follows : The character "要" can be constructed by two radicals "西" and "女" by applying this rule. Similarly, the character "電" is composed of two radicals "雨" and "电" respectively.

#### Composition rule (5)

The relative position of two radicals are the same as in Composition rule (4), except that the second radical is the twice longer than the first one. Symbolically, the character is represented by 

1 st
2 nd

. The operation code for this rule is '&' which signifies the second radical is taller than the first one. The application of this rule can be demonstrated as follows : The character "主" can be constructed by two radicals "亠" and "王" by applying this rule. Similarly, the character "華" is composed of two radicals "艹" and "華" respectively.

#### Composition rule (6)


This rule is similar to Composition rule (5) except that the second radical is shorter than the first one. Symbolically, the character is represented by 

1 st
2 nd


. The operation code for this rule is '!' which signifies the first radical is taller than the second one. The

application of this rule can be demonstrated as follows :  
 The character "書" can be constructed by two radicals  
 "聿" and "日" by applying this rule. Similarly, the  
 character "怎" is composed of two radicals "乍" and "心"  
 respectively.

#### Composition rule (7)

The second radical is enclosed in the first one.  
 Symbolically, the character is represented by .  
 The operation code for this rule is '@'. The application of  
 this rule can be demonstrated as follows : The character  
 "因" can be constructed by two radicals "口" and "大" by  
 applying this rule. Similarly, the character "同" is  
 composed of two radicals "冂" and "百" respectively.

#### Composition rule (8)

The first radical of L shape combines with the second  
 radical to form a square as shown. Symbolically, the  
 character is represented by . The operation code  
 for this rule is '?'. The application of this rule can be  
 demonstrated as follows : The character "這" can be  
 constructed by two radicals "辶" and "言" by applying this  
 rule. Similarly, the character "建" is composed of two  
 radicals "廴" and "聿" respectively.

#### Composition rule (9)

The construction of a character in this category is of the form represented by placing a mirror at the bottom of Composition rule (8).

Symbolically, the character is represented by 

1 st
2 nd

. The operation code for this rule

is '['. The application of this rule can be demonstrated as follows :

The character "有" can be constructed by two radicals "ナ" and "月" by applying this rule. Similarly, the character "老" is composed of two radicals "耂" and "匕" respectively.

#### Composition rule (10)

The construction of a character in this category is of the form represented by placing a mirror at the right of the Composition rule (9).

Symbolically, the character is represented by 

1 st
2 nd

. The operation code for this rule


is ']' . The application of this rule can be demonstrated as follows :

The character "氣" can be constructed by two radicals "气" and "米" by applying this rule. Similarly,

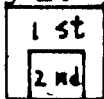
the character "司" is composed of two radicals "丂" and "巳" respectively.

#### Composition rule (11)


The second radical is covered by the first one from the

top. The relative width of the first and the second radicals is shown. Symbolically, the character is represented by . The operation code for this rule is '\$'. The application of this rule can be demonstrated as follows: The character "威" can be constructed by two radicals "戌" and "赤" by applying this rule. Similarly, the character "威" is composed of two radicals "戌" and "日" respectively.

#### Composition rule (12)

This rule is similar to the Composition rule (11) except that the relative size and width with respect to each other are different. The difference in width is shown in FIG. 3-2. It can be described better by the symbol . The operation code for this rule is '^'. The application of this rule can be demonstrated as follows: The character "開" can be constructed by two radicals "門" and "开" by applying this rule. Similarly, the character "春" is composed of two radicals "夊" and "日" respectively.

#### Composition rule (13)

This rule contains only one radical. In other words, the character itself is a radical. Symbolically, the character is represented by . The operation code

for this rule is ' '. The application of this rule can be demonstrated as follows : The character "黃" itself is a radical. Similarly, the character "夷" is also a radical.

#### Composition rule (14)

The radicals of equal size are fully super-imposed. Symbolically, the character is represented by 

1st
+
2nd

. The operation code for this rule is '+'. The application of this rule can be demonstrated as follows : The character "失" has to be constructed by fully super-imposing these two radicals "丩" and "夫". Similarly, the character "升" is fully super-imposed by these two radicals "丩" and "升".

#### Composition rule (15)

This rule indicates the end of operation for generating a character. The operation code for this rule is ' '.

The operation code and its symbol of the fourteen composition rules are shown in FIG. 3-2.



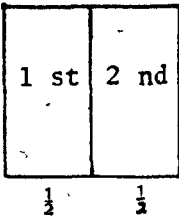
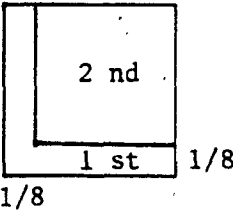
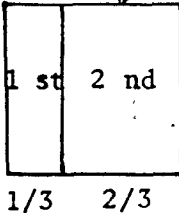
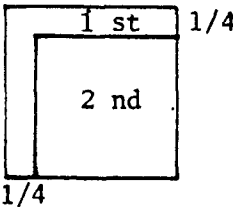
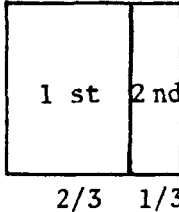
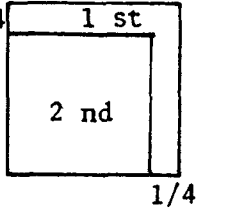
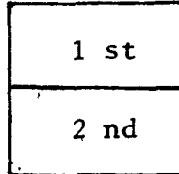
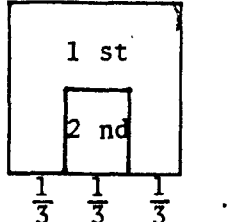
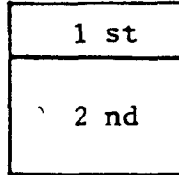
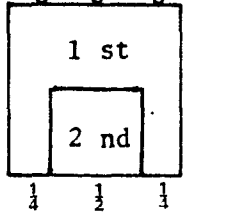
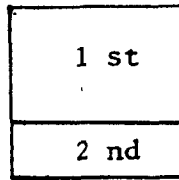
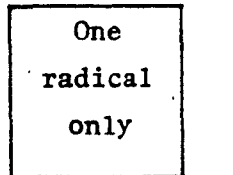
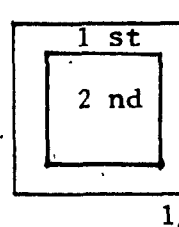
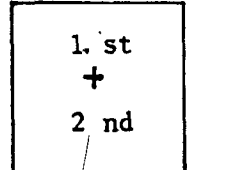
Rule	Op. code	Symbol	Rule	Op. code	Symbol
(1)	"		(8)	?	
(2)	<		(9)	(	
(3)	>		(10)	)	
(4)	;		(11)	\$	
(5)	&		(12)		
(6)	!		(13)	'	
(7)	@		(14)	+	

FIG.3-2 Operation code and its symbol of Composition rules

For the purpose of computing and tabulating the frequency of occurrence of radicals to be presented in chapter IV, we will assign in TABLE 3-1 a position number from 1 to 18 to each distinct radical position and the composition rules involved.


















Position Number	Radical Position (X)	Composition rules involved
1		1, 2, 3
2		1, 2, 3
3		4, 5, 6
4		4, 5, 6
5		7
6		7
7		8
8		8
9		9
10		9
11		10
12		10
13		11, 12
14		11, 12
15		13
16		14
17		14

TABLE 3-1 Relative position number of radicals

In sum, among these fifteen rules '""', '<', and '>' are concerned with left and right combination of two radicals of different scaling factors; '&', ';', and '!' are for the up and down combination of two radicals using different scaling factors; '@', '?', '[', ']', '\$', and '^' are more or less dealing with one radical within the confinement of the other; ' ' is the radical by itself; '+' is a super-position rule for two radicals of the same size; and finally '+' and '.' are introduced to add more flexibility to the process of character generation.

#### III.4 Generation of Chinese Characters from Radicals (Huang & Suen's Scheme)

After having established fifteen composition rules, the next step is to define twenty-eight groups of radicals. A total of six hundred and eighty-seven radicals are selected and assigned in their appropriate groups. TABLES 3-2-(1) and 3-2-(2) contain these six hundred and eighty-seven radicals as well as their corresponding codes. The purpose of the code is to facilitate the generation of digit numbers where the first two digits represent the group number and the last three represent the position of a radical within that group. Each five-digit code has a corresponding radical of graphic form stored in a file TAPE9. Each radical is represented in graphic form by a pre-defined dot-matrix.

FIVE-DIGIT NUMBER OF RADICALS

PART ONE 1 "A" TO "M"

"01001" REPRESENTS THE FIVE-DIGIT NUMBER OF RADICAL "AA"

	A	B	C	D	E	F	G	H	I	J	K	L	M
01001	01008	02012	02016	01007	01004	05036	01003	03025	01005	01010	02018	01009	
一	二	三	四	五	六	七	八	九	十	十一	十二	十三	十四
04008	02013	02004	03004	03044	02010	04013	02014	06017	05010	04023	03017	02008	
又	三	入	一	厶	勹	冂	八	儿	力	尸	マ	ト	
05035	03039	03026	05046	03027	05028	06096	03041	03029	05045	04049	03001	04001	
入	リ	了	弓	口	弓	凡	レ	又	力	口	シ	口	
05005	04020	04010	04008	03010	05015	04002	05012	03009	03014	03030	07005	03018	
又	小	尸	山	工	么	口	巾	巾	止	止	上	弓	三
03023	07020	04027	05019	07032	04040	04029	03020	06047	06044	05051	05040	07015	
十	人	亡	牙	丸	才	子	干	巴	儿	又	戈	乃	
07061	04031	04026	04041	05064	04047	05048	03043	05052	06071	04042	05056	05054	
元	公	ヨ	子	冂	子	夕	才	又	刀	匕	九	又	
05017	05018	04016	05024	07010	06005	04011	06041	04024	04007	06025	04039	07052	
百	斤	主	中	巴	火	八	天	牛	尸	尸	尸	尤	
05029	06028	05031	04044	05043	08019	06032	04019	05044	07026	08039	06095	08036	
少	月	云	六	夕	勿	夫	巾	父	气	反	反	及	
06090	05033	07034	05049	06048	06049	05062	06037	06056	06045	06061	06087	04037	
介	日	予	事	尹	支	云	毛	天	止	反	尸	牛	
07051	04034	06065	06079	06072	07053	06066	08043	04035	07055	06006	05075	07017	
元	大	尸	走	毛	弓	双	弓	土	九	自	木	疋	
05026	06069	05032	08044	09018	07007	07068	06011	06010	07067	08017	05037	07046	
业	以	乍	四	第	矢	穴	血	石	册	八	正	尔	
05044	07056	08025	10009	08022	07036	07037	06039	07025	07011	07014	05042	06091	
平	邪	句	包	央	目	必	牙	来	水	未	半	虫	
06043	08041	06042	06068	05067	07035	06062	09022	08042	08029	05070	11005	07071	
甲	戊	巨	子	左	无	斥	另	史	气	五	册	父	
06076	10051	09031	07078	09001	06008	06081	09003	07022	06030	07012	09008	07023	
事	谷	囧	北	系	所	在	西	至	生	自	良	四	
08014	08023	10003	07024	09014	06050	07038	07074	08053	09011	06027	09028	08088	
而	衣	羽	亥	先	革	来	黑	如	舟	羊	更	主	
00021	07070	07072	09023	08056	08047	09020	08050	08058	07075	08038	09034	08027	
吊	宜	天	肉	良	竹	来	朱	先	未	同	瓜	瓜	
00013	08002	08004	08008	10043	08007	10044	08005	13008	09015	07028	07006	10016	
担	貝	車	里	見	豆	豕	那	走	羊	平	更	更	
00017	00007	07045	09039	02011	00030	09037	09043	08023	00031	09041	02008	08021	
更	馬	坐	余	罔	覓	昌	兩	去	成	赤	美	仙	
09030	00037	00038	11021	08003	09005	09002	10034	11003	10002	08016	10019	10046	
声	更	覓	門	佳	看	金	來	尚	雨	其	長	取	
11010	00014	12005	09021	12025	00028	12012	10033	08054	00049	00027	09055	03019	
制	煨	免	貝	帛	夜	亞	武	年	舍	正	若	承	
00032	09048	11013	11015	10001	00012	12001	16008	13005	10035	10029	11006	14001	
永	玄	東	馬	頁	重	馬	馬	高	青	面	雨	方	
03003	03010	02004	10053	14015	02016	10015	09046	03025	04012	04009	03023	11014	
高	更	西	音	段	馬	單	解	索	豕	豕	豕	交	
03007	03013	04021	02010	00007	04025	03020	05008	08002	00050	03024	02013	10017	
康	馬	家	雅	韵	業	牙	非	蜀	省	真	淵	重	
02027	05001	06009	02022	03016	02007	13011	02024	03012	06002	01013	04028	04018	
星	車	帶	國	寶	重	車	曲	玉	鹿	走	食	食	
04022	00003	00010	17004	03018	03022	06009	04023	05006	04011	03004	05005	15001	
美	馬	段	降	更	金	林	堂	花	那	林	西	食	
00016	00008	07002	07001	03007	04032	17009	17001	19006	22002	04007	08003	22001	
看	黑	馬	馬	馬	出	意	裏	馬	馬	馬	馬	龍	
25001	24003	24002	26001	24004	21003	25002	27001	27002	27004	28001			
藏	西	細	龍	龍	龍	龍	龍	龍	龍	龍			

TABLE 1-2-(1)

FIVE-DIGIT NUMBER OF RADICALS

PART TWO: "N" TO "Z"

("02001" REPRESENTS THE FIVE-DIGIT NUMBER OF RADICAL "AN")

	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
A	02001	04014	02002	02009	03007	04005	02007	05008	02006	04018	04038	02022	05013
B	03011	03018	06054	04032	04030	02015	03022	03035	03040	06019	02011	03021	05068
C	04009	04004	05003	04003	03006	06040	06003	03002	05016	05073	05011	03008	03012
D	03005	03003	05014	03015	05020	06070	03042	06022	03034	03033	03031	06051	06055
E	05071	03019	03016	06036	04025	04036	04048	06058	03028	07033	05063	03024	05047
F	05030	05002	05001	07001	07002	04015	05006	06002	06097	06014	04028	10006	06026
G	05039	04017	06057	05023	07004	04022	07027	06013	07039	05025	08049	05041	04021
H	07040	05021	05065	07073	06046	05053	04033	06073	06038	06034	04045	04024	07041
I	07029	04046	07054	06029	07062	04043	07066	06078	06074	06080	05057	06064	06034
J	05009	06001	06016	06004	07008	06018	06009	06007	06035	05022	08012	08011	08010
K	08032	06021	09007	10025	06094	07044	06020	07042	06031	05034	05061	06015	08030
L	06060	08035	06103	05027	07021	08024	06053	07030	05050	05069	06067	08045	09042
M	06093	06075	06089	06059	06052	05035	07043	06092	07077	07058	09049	07057	07059
N	08008	07003	07018	07019	08013	10004	06012	07009	06023	07031	09004	07050	08020
O	07069	08031	09052	08052	06100	10022	07013	09038	10047	07047	09013	06033	07016
P	10054	11009	08055	08051	12006	09044	09024	10036	06104	07079	07076	11022	08001
Q	09016	08009	09026	10042	08026	10005	09006	09033	10010	09025	10023	11004	10011
R	09017	09040	11020	10048	08037	10018	09047	11011	11019	07048	08046	07060	10052
S	11007	09010	11012	10026	11016	08018	10024	08015	11002	09012	10045	09009	08033
T	09035	09053	09029	12026	08057	10040	09036	12028	09050	09051	09027	12014	10039
U	12014	12017	12002	10020	12023	18006	14008	11018	10008	12018	14017	13006	09019
V	12020	16004	16003	14007	14004	12019	12003	14002	14006	14014	14027	14024	13008
W	13017	13015	14016	14026	13021	13009	14003	13001	14010	16012	14005	18004	14020
X	12021	16015	17012	13002	13004	15007	15003	15002	14011	15004	17008	16014	17007
Y	16005	17006	17005	16016	21002	17014	17013	17015	16006	18001	23002	19003	20002
Z	19005	17010	19004	24001	21003	20002	20001	19001	21001	27001	21004	23001	19002
	夏	蓄	燕	應	義	繼	藍	羅	裏	鬼	府	命	渠

TABLE 3-2-(2)

For example, the corresponding number of code FO is 05002 which means this radical has five strokes and thus is in group five and it is the second element in the group. Its graphic form is " 𠂇 ".

In order to plot the graph of a radical, the x,y coordinates have to be supplied to the graphics system or the PRINTRONIX plotter. For example, 8 28, 8 8, 8 28, 28 28, 28 28, 28 8, 8 18, 28 18, 8 8, 28 8 are the coordinates required for the graphic system to plot the radical " 𠂇 ". The number of sets of x,y coordinates for each radical is twice the number of radical group number. Since the graphic system can only draw a straight line between two points, a curve can only be generated by joining multiple segments of straight lines. This technique is used to smooth the shape of radicals with curvature. For example, the character " 人 " is defined as having two strokes in a Chinese dictionary. However, in order to present it smoothly it is considered as a character with four strokes in our system.

The process of generating the above radical " 𠂇 " is illustrated as follows :

A) Draw a left vertical line by joining two points with coordinates (8,28) and (8,8) respectively.

B) Draw an upper horizontal line by joining (8,28) and

(28,28) ..

C) Draw a right vertical line by joining (28,28) and (28,8).

D) Draw a horizontal line in the middle by joining (8,18) and (28,18).

E) Draw a lower horizontal line by joining (8,8) and (28,8).

A character is generated by the application of composition rules on pre-defined radicals. The process of generating a character can be an iterative one. In some cases, the combination of two radicals is considered as an intermediate character which needs to be rescaled to form a character containing one more radical. Examples of increasing complexity are presented below.

Example 1 : The character "她"

STEP 1

composition rule : "

first-radical : CP (女) }  
second radical : CS (也) } 她

STEP 2


composition rule : .




Note : 1) CP will become the left half of the generated character. The width of this radical is reduced by half.

2) CS will become the right part of the character. Similarly the size of this radical is also reduced by half horizontally.


3) The composition rule "." indicates that it is the end of the current character.

Example 2 : The character "踢" 

STEP 1


composition rule : &  
first radical : FO (足) }  
second radical : HF (勿) } 

STEP 2

composition rule : "  
first radical : QH (正) }  
second radical : O (易) } 

STEP 3

composition rule : .

Note : 1) Composition rule "&" scales the radical FO to 1/3 and HF to 2/3 of their original sizes vertically and combines them to form an intermediate character "易" .

2) In step 2, the radical 0 takes the intermediate character from STEP 1 as the second radical in STEP 2. The intermediate character will be composed with the first radical QH by the composition rule ' "' to form the final character.

Example 3 : The character "說"

STEP 1

composition rule : ;

first radical : AV ( V ) } 𠂔

second radical : CM ( 口 ) }

STEP 2

composition rule : !

first radical : 0 ( 𠂔 ) } 𠂔

second radical : AZ ( 儿 ) }

STEP 3

composition rule : "

first radical : PZ ( 言 ) } 說

second radical : 0. ( 𠂔 ) }

STEP 4

composition rule : .

Note : 1) The above is an example using four composition rules. In fact, the number of composition rules used to generate a character is not limited. The user is allowed to apply as many composition rules as needed.

2) The radical '0' can be used as the first radical as in STEP 2 or as the second radical as in STEP 3.

3) The composition rule "!" scales its first radical 0 to 2/3 of its size and second radical BP to 1/3 of its size vertically.

Example 4 : The character "聲"

STEP 1

composition rule : ;

first radical : -1

second radical : NT (耳) } 耳

STEP 2

composition rule : +

first radical : WY (聲) } 聲

second radical : 0 (耳) }

STEP 3

composition rule : .

Note : 1) A "-1" radical is used in STEP 1 of this example. It means that there is no radical for the first one in STEP 1. The second radical NT of STEP 1 is scaled vertically to 1/2 of its size.

2) In STEP 2, the superimpose composition rule is used to combine radical WY and the intermediate character formed in STEP 1. Superimpose implies that no scaling is

performed, the radicals are just placed one over the other.

Example 5 : The character " 匡 "

STEP 1

composition rule : e

first radical : BY ( 匚 )

second radical : FS ( 王 )

} 匡

STEP 2

composition rule : .

Note : This is an example of containment.

Example 6 : The character " 楊 "

STEP 1

composition rule : >

first radical : FP ( 木 )

second radical : -1

} 木

STEP 2

composition rule : "

first radical : -1

second radical : UM ( 易 )

} 易

STEP 3

composition rule : +

first radical : 0 ( 木 )

second radical : 0 ( 易 )

} 楊

STEP 4

composition rule : .

Note : 1) This is an example of scaling the radicals independently to desired sizes and positions, then the superimpose composition rule is used to group them together.

2) There are two intermediate characters formed before the composition rule "+" is applied. In STEP 2, prior to the construction of the second intermediate character "易", all coordinates of the first intermediate character "木" from STEP 1 are transferred from array "FINAL" to an auxiliary array "FIRST". Then the character constructed in STEP 2 is stored in array "FINAL". Since both radicals in STEP 3 are zeros, the first radical will take the character in array "FIRST" (ie. the first intermediate character) and the second radical takes the character from array "FINAL" (ie. the second intermediate character).

### III.5 Implementation of the Scheme in the Computer

The scheme as described in section III.4 has been implemented on the CDC CYBER 170 computer with a Tektronix graphics system and a PRINTRONIX plotter at Concordia University. The software is coded in PASCAL language and is compiled by the PASCAL compiler version 3.3.0 (82/06/10). The software implemented has basically four main functions : initialization, command input, command decoding, and

character generation. Each function is further divided into subfunctions which are represented by procedures.

### INITIALIZATION

There are three procedures.

PROCEDURE "INITIAL" defines the symbols of the fifteen composition rules as described in section III.3 and two format operation codes. These two codes are for editing purpose. One is to insert a blank character and the other one is to skip to the next line. Symbolically they are represented by "#" and "=" respectively.

PROCEDURE "INITIALTABLE" reads the translation table from a file TAPE9 and store it in the array "TABLE". This file contains five digit numbers for each radical input code. The complete input codes and the translation table are shown in Appendices 3 & 5 respectively.

PROCEDURE "INITIALTAPE10" reads the coordinates of radicals from a file TAPE10 and store them in array "BASE". The complete listing of the file is shown in Appendix 4.

### COMMAND INPUT

PROCEDURE "READBUFFER" reads the input codes from the

"INPUT" file.

### COMMAND DECODING

There are eight procedures.

PROCEDURE "GETTOKEN" validates the input command. A command is a string of characters which direct the software to follow a specific sequence of processes to generate Chinese characters. Each command character should have a pre-defined radical code, a composition rule symbol, an operation code, a left parenthesis or a right parenthesis. An error message is generated whenever the validation of the command fails.

PROCEDURE "STATE0" checks whether a command character is a radical code or a left parenthesis. If a radical code is detected, PROCEDURE "STATE1" is called. If a left parenthesis is detected, PROCEDURES "PUSHPARENTHESIS" and "STATE0" are called.

PROCEDURE "STATE1" checks whether the command characters are of a composition rule code or a left parenthesis. If a composition rule code except "'" and "." is detected, PROCEDURE "STATE2" is called. If a composition rule "'" or "." is detected, PROCEDURE "NOPARENTHESIS" is called. If a left parenthesis is detected, PROCEDURES

"GENERATECODE" and "STATE1" are called.

PROCEDURE "STATE2" checks whether the command characters are of a radical code or a left parenthesis. If a radical code is detected, PROCEDURE "STATE1" is called. If a left parenthesis is detected, PROCEDURES "PUSHPARENTHESIS" and "STATE0" are called.

The above three procedures determine the processing sequence for the input command. The relationship among these three procedures can be depicted in the following diagram FIG. 3-3.

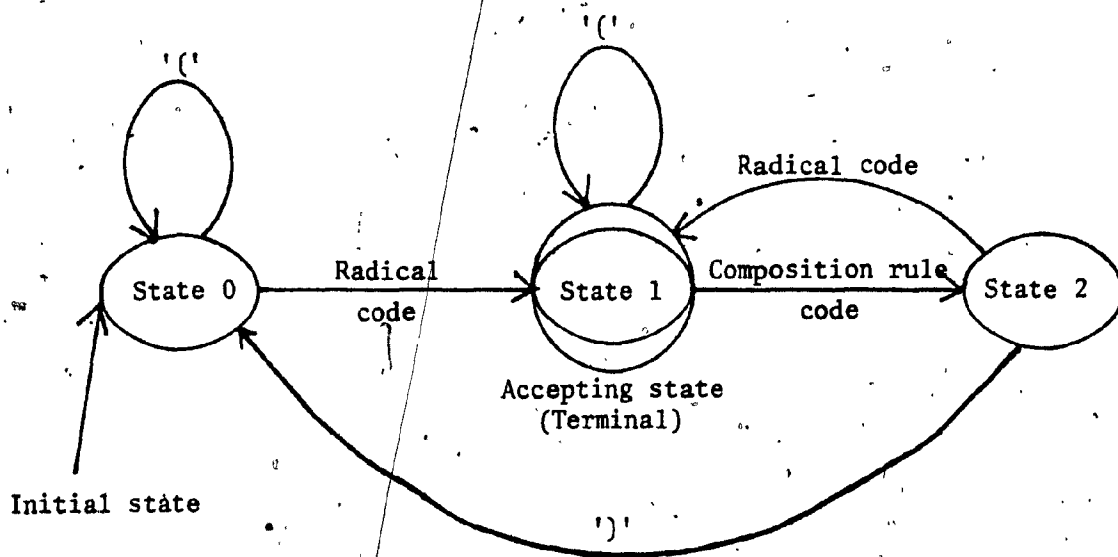


FIG.3-3 Relationship among three states



PROCEDURE "GENERATECODE" stores the processing sequence derived from the previous three procedures in appropriate locations.

PROCEDURE "NOPARENTHESIS" deals with the arranged processing sequence where the function of parenthesis has been taken into account.

PROCEDURE "PUSHPARENTHESIS" checks whether the number of left parentheses is equal to that of right parentheses when the character '(' is encountered.

PROCEDURE "POPPARENTHESIS" checks whether the number of right parentheses is equal to that of left parentheses when the character ')' is encountered.

#### CHARACTER GENERATION

PROCEDURE "CONSTRUCTOR" initiates the character generation process based on the previously determined processing sequence. Each process has two radicals and one operation code. These parameters are passed to the PROCEDURE "GENERATECODE".

PROCEDURE "GENERATOR" is the principal program which performs the actual Chinese character generation. Based on the operation code, i.e. the composition rule, the

appropriate procedure is called to generate a final character or an intermediate character. It should be noted that two format operation codes are also included in this procedure. The procedure also has the feature of displaying the constructed character on the Tektronix graphics terminal for verification purpose. The resultant coordinates for a character are stored in a file called TAPE8 which becomes the input file to the graphic display program "DISPLAYER". The character generated can be shown on the Tektronix 4010 graphics terminal or on a PRINTRONIX plotter. The hardcopy listing is produced by a plotter attached to it.

PROCEDURE "VERTICAL" rescales vertically the size of a character into two parts according to the desired scaling factors such that the first radical is on the left and the second radical is on the right. Composition rules (1), (2), and (3) require this procedure. In the case of composition rule (1), this procedure multiplies all x coordinates of the first radical by 0.5 to yield numbers ranging from 0 to 18. Similarly all x coordinates of the second radical are also multiplied by 0.5 and added to the base 18 to yield numbers ranging from 18 to 36. The two modified radicals are then combined to form a new character. In the case of composition rule (2), the same methodology is used except that 0.3333 and 0.6667 are applied to the first radical and to the second radical respectively. The value of the x coordinates of the first radical will lie between 0 and 12.

By adding 12 to the x coordinates of the second radical, the value will fall into the range of 12 to 36.

PROCEDURE "HORIZONTAL" rescales horizontally the size of a character into two parts according to the desired scaling factors such that the first radical is on the top of the second radical. Composition rules (4), (5), and (6) require this procedure. The procedure is analogous to that described in the previous paragraph. In the case of composition rule (4), the procedure multiplies all y coordinates of the first radical by 0.5 to yield numbers ranging from 0 to 18. Similarly all y coordinates of the second radical are also multiplied by 0.5 and added to the base 18 to yield ordinates ranging from 18 to 36. The two modified radicals are then combined to form a new character. In the case of composition rule (5), the same method is used except that 0.3333 and 0.6667 are applied to the first radical and to the second radical respectively. The value of the y coordinates of the first radical will lie between 0 and 12. By adding 12 to the y coordinates of the second radical, the value will fall into the range of 12 to 36.

PROCEDURE "NATURE" super-imposes two radicals of equal size or retains the same size for a radical itself of being a character. Composition rules (13) and (14) require this procedure.

PROCEDURE "CONTAINER" divides the size of a character into two parts such that the second radical is contained in the first radical. Composition rules (7), (8), (9), (10), (11), and (12) require this procedure. The relative position and size are described in section III.3.

PROCEDURE "DIRECTACCESSOR" gets the coordinates of a radical from the array "BASE" by computing the starting position.

Other procedures from the Tektronix graphics and the PRINTRONIX plotter package are invoked. They are written in FORTRAN language and presented below.

```
PPROCEDURE INITT (BAUD%INTEGER;IFILE,OFILE%TEXT;  
                 IBUF,LBUF%INTEGER);
```

```
PROCEDURE SWINDO (MINX,LENX,XMINY,LENY%INTEGER);
```

```
PROCEDURE DWINDO (XMIN,XMAX,YMIN,YMAX%INTEGER);
```

```
PROCEDURE VWINDO (XMIN, XMAX, YMIN, YMAX % REAL);
```

```
PROCEDURE DRAWD (X, Y % REAL);
```

```
PROCEDURE MOVEA (X, Y % REAL);
```

PROCEDURE FINITT (IX, IY % IINTEGER);

PROCEDURE ANMODE;

PROCEDURE HDCOPY;

The description of these procedures can be found in a Tektronix 4010 manual [19].

The procedures from the PRINTRONIX plotter are listed below.

CALL PLOTS (0.0, 0.0, 99)

CALL PLOT (X, Y, KPEN)

CALL MODE (KROW, ARG1, ARG2, ARG3)

The description of these three procedures can be found in a PRINTRONIX PLOTTING SOFTWARE [21].

The relationship between various files and software functional components can be summarized in the following diagram FIG. 3-4.

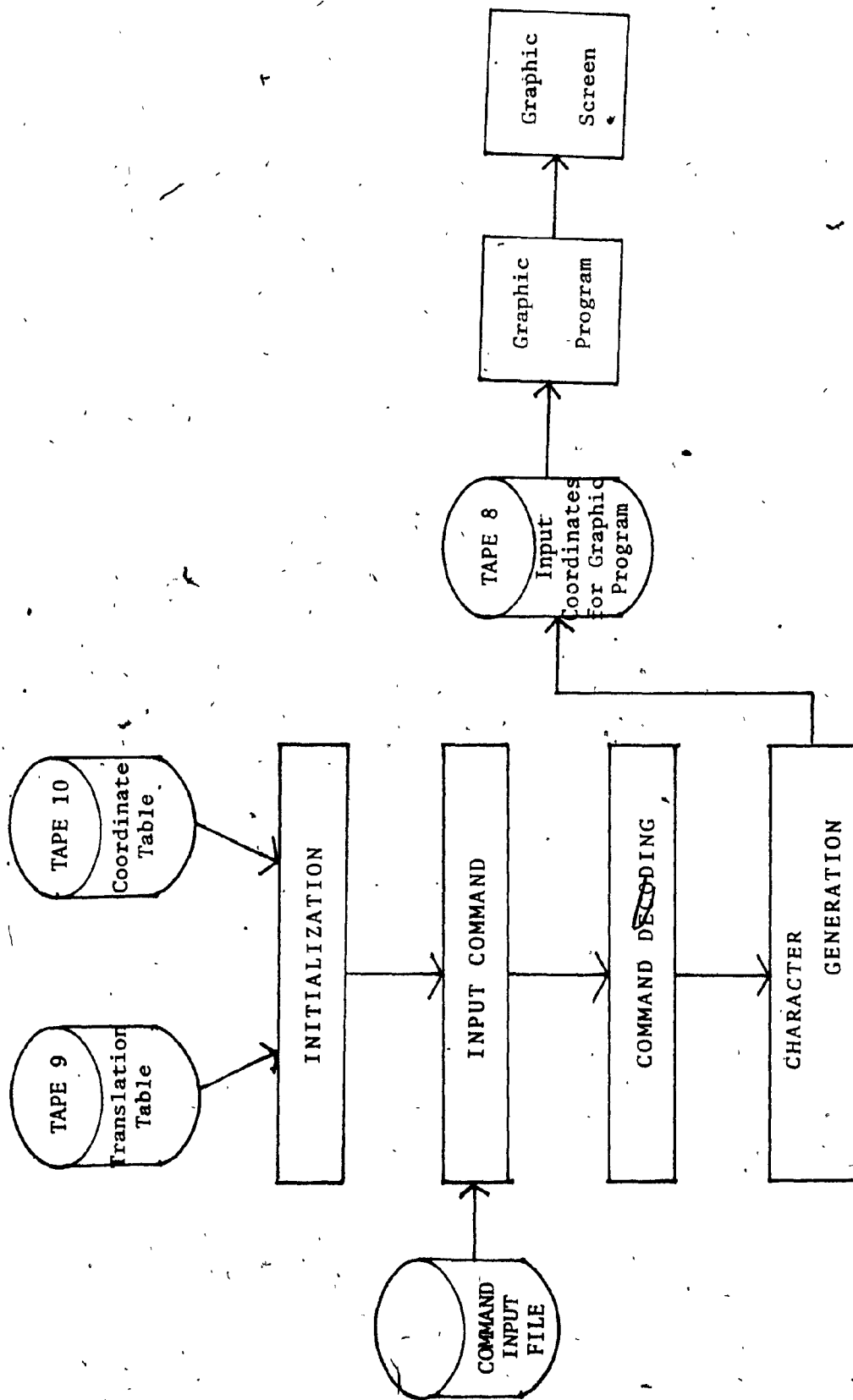


FIG. 3-4 Relationship between files and software functional components

The first and the last pages of the complete listing of Chinese characters of size 36x36, generated by this software using the input commands of Appendix 5 are presented in FIG. 3-5. The complete listing is given in Appendix 6.

0001	0016	0031	0046	0061	0076	0091	0106	0121	0136
的	們	會	也	西	行	部	之	定	常
一	上	生	作	方	事	同	山	外	業
是	三	地	後	校	起	八	沒	然	因
我	這	五	多	六	所	動	最	加	些
了	中	年	下	本	美	爲	經	工	候
有	到	家	着	面	南	什	課	由	名
國	個	說	子	過	兒	月	分	還	心
不	和	用	很	教	公	爲	於	物	力
在	以	第	日	樣	東	做	開	電	進
他	就	小	麼	能	圖	七	又	主	前
人	學	可	成	那	自	明	師	江	得
大	要	都	你	北	市	海	老	氣	文
十	天	去	看	發	法	兩	等	從	媽
二	時	裏	民	把	種	高	各	新	路
來	四	好	出	水	對	九	如	長	軍



4751	4766	4781	4796	4811	4826	4841	4856
寗	牀	沈	疎	帛	顛	輾	鐔
双	樓	墻	劑	洒	捆	著	勦
乃	冰	献	粘	蕪	踪	擦	勾
猪	鬪	食	胆	舍	焊	崧	灶
博	鬪	麥	煨	潤	員	咏	粧
丰	烟	壳	劍	涌	諱	覩	鉢
幹	著	輓	磚	陟	豕	忽	毘
啟	況	隄	余	王	碱	釐	憇
挂	蹟	忻	腊	携	椶	荒	笋
迪	迹	臺	嚴	耻	妬	呪	
畧	杆	曬	言	背	吓	脣	
盃	廈	吓	洩	武	頰	翊	
担	包	峰	勾	金	吊	邳	
金	包	冲	金	食	雇	咽	
禾	濕	賁	石	秀	耽	壹	

## CHAPTER IV

### ANALYSIS AND DISCUSSION OF THE SCHEME

#### IV.1 Introduction

In chapter III, we have discussed the structure of Chinese characters. We have also derived fifteen composition rules and two formatting codes which are considered to be sufficient to construct Chinese characters using the twenty-eight groups of radicals as defined in Appendix 1.

The software system developed to generate Chinese characters using the scheme described in section III.4 has produced the 4864 characters shown in Appendix 6.

In order to find out how the scheme fares in practical use, we have performed a series of analysis using the data

from references [15,18], which gave the frequency occurrence of the 4864 most frequently used Chinese characters.

#### IV.2 Frequency of Occurrence of Radicals

An analysis of the frequency of occurrence of radicals in the 4864 most frequently used Chinese characters could be useful for improving future software design because one could place the radicals in the search table in such a way that the time required to search radicals can be optimized. In TABLE 4-1, the frequency of occurrence of the radicals in the 4864 most frequently used Chinese characters is presented. The percentage frequency distributions of the first, second, third, and fourth sets of fifty radicals of the data base in descending order are presented in TABLES 4-2, 4-3, 4-4, and 4-5 respectively. Similar information for 753,941 samples for the vocabulary of the 4864 characters which appear in references [15,18], is shown in TABLE 4-6. TABLE 4-6 should be used as a guide for the future design of the radical table in Appendix 1. The percentage frequency distributions of the first, second, third, and fourth sets of fifty radicals in the 753,941 samples in descending order are presented in TABLES 4-7, 4-8, 4-9, and 4-10 respectively.

An analysis of the frequency of occurrence of the

radical's position and of the latter's percentage in the 4864 characters and the 753,941 samples are presented in Appendices 8, 9, and 10, 11 respectively in which the analysis of occurrence is by the position number as assigned in chapter III.

TABLES 4-11 and 4-12 present the frequency distribution of the various radicals which occur in the 4864 characters and the 753,941 samples in descending order by position number. These two tables are useful for identifying those radicals which appear more frequently in the 17 defined positions.

FREQUENCY OCCURRENCE OF RADICALS OF 4864 CHARACTERS

	A	B	C	D	E	F	G	H	I	J	K	L	M
	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
A	99	17	16	11	33	14	10	6	13	3	2	1	1
	207	55	81	23	72	57	44	72	44	13	5	57	35
B	58	6	77	74	56	37	33	27	28	40	21	28	32
	39	14	6	11	10	11	15	3	4	32	17	25	4
C	1	2	8	4	12	13	5	2	4	6	348	330	77
	34	122	133	217	38	11	105	263	36	54	59	50	46
D	58	21	78	95	48	40	109	60	64	32	5	32	2
	84	60	65	41	20	2	21	26	4	5	5	7	6
E	15	16	15	35	9	4	12	22	9	11	4	7	20
	7	19	33	11	16	6	1	5	6	7	10	10	5
F	3	2	6	2	6	5	3	1	3	1	2	1	2
	2	293	295	204	104	109	90	99	10	49	13	31	17
G	43	38	35	8	23	93	45	11	18	50	30	13	3
	9	33	26	15	40	21	10	41	9	15	19	9	22
H	18	18	11	3	5	12	17	25	7	11	3	10	5
	5	17	8	28	9	3	8	2	13	15	20	21	6
I	6	11	10	13	8	8	13	13	4	8	9	11	7
	10	11	2	5	1	3	2	1	2	1	5	3	6
J	3	4	3	1	2	3	2	1	1	2	69	88	12
	64	127	35	70	27	35	68	55	15	13	19	18	25
K	10	3	12	2	7	24	32	60	62	20	15	8	4
	7	25	18	5	17	11	27	5	16	3	12	43	8
L	7	2	10	16	11	9	8	12	14	19	10	8	8
	5	6	1	14	4	10	7	2	6	2	3	8	7
M	10	2	10	3	4	5	4	3	2	7	5	6	15
	3	2	5	5	7	7	5	3	2	2	1	4	2
N	1	1	1	1	141	71	1	36	13	19	22	16	16
	50	89	17	17	21	37	46	21	22	10	16	2	12
O	16	10	37	14	12	8	8	7	6	14	20	2	22
	11	8	5	8	2	7	21	5	5	3	12	18	18
P	7	7	4	3	7	1	5	9	2	5	3	6	9
	1	3	3	10	5	3	3	1	2	1	1	1	123
Q	13	112	66	28	24	10	15	49	13	10	11	32	8
	10	25	3	29	10	32	26	15	15	3	7	3	15
R	9	2	4	7	3	3	3	3	9	5	10	5	10
	8	5	2	4	5	9	2	2	1	4	1	3	1
S	1	1	1	55	37	28	121	2	32	42	16	9	10
	4	14	1	5	30	12	6	16	29	15	5	15	7
OT	3	12	7	4	5	4	2	4	5	5	4	5	1
	5	3	2	2	2	1	4	4	2	2	3	1	1
T	3	2	1	2	50	13	45	3	11	2	3	5	15
	5	11	13	3	3	1	7	2	21	3	2	10	7
U	15	7	7	4	12	12	2	1	5	4	1	2	2
	5	5	7	3	1	6	12	13	8	3	1	2	5
V	9	4	5	3	2	1	1	1	5	1	1	1	3
	2	3	2	1	1	8	12	23	7	5	9	2	28
W	4	13	2	3	2	5	6	2	4	11	4	2	1
	3	1	1	14	12	3	8	11	5	3	1	4	2
X	4	3	2	3	1	1	3	2	1	1	5	12	1
	3	3	4	1	4	2	1	3	4	7	2	6	3
Y	5	2	6	6	1	4	3	1	2	1	4	5	14
	2	2	3	1	3	1	1	7	7	3	3	4	1
Z	3	1	10	5	1	1	1	1	2	2	1	1	1

TABLE 4-1

PERCENTAGE FREQUENCY DISTRIBUTIONS OF THE FIRST SET OF FIFTY RADICALS

RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT
1	CK (口)	2.76 %	2	CL (彡)	2.61 %	3	FP (木)	2.34 %	4	CU (十)	2.08 %
5	FQ (日)	2.00 %	6	CQ (才)	1.72 %	7	AN (亻)	1.64 %	8	FQ (月)	1.62 %
9	NE (魚)	1.12 %	10	CP (女)	1.05 %	11	JO (田)	1.01 %	12	PZ (言)	0.97 %
13	CO (冂)	0.97 %	14	SG (金)	0.96 %	15	QB (貝)	0.89 %	16	DG (口)	0.86 %
17	FS (王)	0.86 %	18	CT (下)	0.83 %	19	FR (乚)	0.82 %	20	AA (一)	0.78 %
21	FU (尸)	0.78 %	22	DD (山)	0.75 %	23	GF (火)	0.74 %	24	FT (攴)	0.71 %
25	NO (虫)	0.71 %	26	CR (厶)	0.70 %	27	JL (禾)	0.70 %	28	SE (隹)	0.69 %
29	CN (寸)	0.67 %	30	DN (卜)	0.67 %	31	AP (十)	0.64 %	32	DC (广)	0.62 %
33	BC (人)	0.61 %	34	CH (口)	0.61 %	35	BD (冂)	0.59 %	36	AR (亻)	0.57 %
37	AU (力)	0.57 %	38	NF (竹)	0.56 %	39	JQ (目)	0.55 %	40	JK (白)	0.55 %
41	JT (示)	0.54 %	42	QC (車)	0.52 %	43	DP (尸)	0.52 %	44	DI (土)	0.51 %
45	JN (立)	0.51 %	46	KI (石)	0.49 %	47	DH (巾)	0.48 %	48	DO (土)	0.48 %
49	KH (血)	0.48 %	50	CX (大)	0.47 %						

ACCUMULATION = 45.86 %

TABLE 4-2

PERCENTAGE FREQUENCY DISTRIBUTIONS OF THE SECOND SET OF FIFTY RADICALS

RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT
51	BA (又)	0.46 %	52	DA (久)	0.46 %	53	AS (匕)	0.45 %	54	AY (一)	0.45 %
55	BE (厶)	0.44 %	56	AO (勹)	0.44 %	57	JU (𠂇)	0.44 %	58	SD (門)	0.44 %
59	CW (夕)	0.43 %	60	CY (士)	0.40 %	61	GJ (𠂇)	0.40 %	62	NN (米)	0.40 %
63	UE (頁)	0.40 %	64	FW (方)	0.39 %	65	QH (足)	0.39 %	66	CZ (彳)	0.38 %
67	DE (工)	0.38 %	68	NT (耳)	0.36 %	69	GG (𠂇)	0.36 %	70	UG (馬)	0.36 %
71	AT (尸)	0.35 %	72	AV (彳)	0.35 %	73	GA (百)	0.34 %	74	KY (疒)	0.34 %
75	SJ (雨)	0.33 %	76	DQ (彡)	0.32 %	77	GU (戈)	0.32 %	78	BJ (刀)	0.32 %
79	DF (彡)	0.32 %	80	GR (欠)	0.32 %	81	BN (厂)	0.31 %	82	GB (斤)	0.30 %
83	BF (彳)	0.29 %	84	NS (唐)	0.29 %	85	OC (羽)	0.29 %	86	CV (子)	0.29 %
87	NH (西)	0.29 %	88	AZ (儿)	0.28 %	89	ED (彳)	0.28 %	90	GC (主)	0.28 %
91	JP (古)	0.28 %	92	JS (古)	0.28 %	93	AE (一)	0.26 %	94	BG (冂)	0.26 %
95	EP (大)	0.26 %	96	GO (止)	0.26 %	97	BM (卜)	0.25 %	98	BW (巳)	0.25 %
99	DT (亼)	0.25 %	100	DL (弓)	0.25 %						

ACCUMULATION = 62.88 %

TABLE, 4-3

PERCENTAGE FREQUENCY DISTRIBUTIONS OF THE THIRD SET OF FIFTY RADICALS

RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT
101	KG (穴)	0.25 %	102	QL (辛)	0.25 %	103	QS (酉)	0.25 %	104	SI (尚)	0.25 %
105	FY (爰)	0.25 %	106	GK (戶)	0.24 %	107	QF (豆)	0.24 %	108	SR (林)	0.24 %
109	QQ (采)	0.23 %	110	SV (食)	0.23 %	111	BI (几)	0.22 %	112	BL (マ)	0.22 %
113	HQ (比)	0.22 %	114	QD (里)	0.22 %	115	SF (者)	0.22 %	116	WU (魚)	0.22 %
117	WZ (鳥)	0.22 %	118	BH (八)	0.21 %	119	JR (可)	0.21 %	120	KT (衣)	0.21 %
121	DU (彡)	0.21 %	122	GP (犬)	0.21 %	123	QT (甫)	0.21 %	124	BY (匚)	0.20 %
125	HH (宀)	0.20 %	126	JZ (戌)	0.20 %	127	KO (且)	0.20 %	128	QO (原)	0.20 %
129	KF (矢)	0.19 %	130	QE (見)	0.19 %	131	LO (ナ)	0.18 %	132	GE (巴)	0.18 %
133	EH (干)	0.17 %	134	GZ (丰)	0.17 %	135	LI (自)	0.17 %	136	NV (共)	0.17 %
137	OM (圭)	0.17 %	138	BK (尸)	0.17 %	139	DB (小)	0.17 %	140	DT (千)	0.17 %
141	GS (廿)	0.17 %	142	HY (尹)	0.17 %	143	NR (回)	0.17 %	144	NU (白)	0.17 %
145	OT (缶)	0.17 %	146	UV (革)	0.17 %	147	DR (子)	0.16 %	148	EM (乃)	0.16 %
149	HX (廴)	0.16 %	150	KJ (册)	0.16 %						

ACCUMULATION = 72.87 %

TABLE 4-4



PERCENTAGE FREQUENCY DISTRIBUTIONS OF THE FOURTH SET OF FIFTY RADICALS

RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT
151	OK (羊)	0.16 %	152	EO (山)	0.15 %	153	GX (分)	0.15 %	154	JX (用)	0.15 %
155	LJ (水)	0.15 %	156	NJ (生)	0.15 %	157	GI (牛)	0.14 %	158	HA (少)	0.14 %
159	HB (月)	0.14 %	160	JY (母)	0.14 %	161	KP (皮)	0.14 %	162	OY (衣)	0.14 %
163	OZ (失)	0.14 %	164	AB (、)	0.13 %	165	BX (X)	0.13 %	166	FZ (伙)	0.13 %
167	HG (夫)	0.13 %	168	HO (文)	0.13 %	169	KR (旦)	0.13 %	170	NP (聿)	0.13 %
171	NQ (交)	0.13 %	172	AC (丿)	0.13 %	173	EB (又)	0.13 %	174	ER (升)	0.13 %
175	KV (由)	0.13 %	176	LD (包)	0.13 %	177	NL (艮)	0.13 %	178	NM (四)	0.13 %
179	NX (豕)	0.13 %	180	OA (而)	0.13 %	181	SK (其)	0.13 %	182	SU (非)	0.13 %
183	ST (丁)	0.12 %	184	EA (丰)	0.12 %	185	EC (亡)	0.12 %	186	GQ (开)	0.12 %
187	GW (丩)	0.12 %	188	HW (彳)	0.12 %	189	JV (去)	0.12 %	190	KK (心)	0.12 %
191	MM (父)	0.12 %	192	QG (豕)	0.12 %	193	QU (谷)	0.12 %	194	QV (辰)	0.12 %
195	QZ (束)	0.12 %	196	SW (直)	0.12 %	197	SY (卓)	0.12 %	198	UM (易)	0.12 %
199	VA (曷)	0.12 %	200	AF (人)	0.11 %						

ACCUMULATION = 79.38 %

TABLE 4-5

FREQUENCY OCCURRENCE OF RADICAL OVER 753,941 SAMPLES

	A	B	C	D	E	F	G	H	I	J	K	L	M
	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
A	32913	27471	3569	1620	1547	1509	1289	1204	399	202	51	20	4
B	38903	28311	11141	10100	10089	9812	9469	8755	3190	7611	7385	7009	5588
C	5627	5605	5537	4453	4209	3672	3622	3615	2939	2517	2464	2416	2272
D	2271	2012	1982	1668	1554	1469	1427	1401	1153	1147	360	758	567
E	521	486	398	390	274	216	134	70	53	41	46409	23189	6853
F	16117	14823	14662	12358	12057	11921	11685	11384	10736	10106	10094	9742	9734
G	8571	8234	8187	7908	7721	7695	7066	6851	5727	5272	4554	4330	4007
H	3934	3912	3182	2888	2876	2476	2303	2206	2168	2063	1847	1594	1418
I	1398	1348	1122	1059	1049	1013	949	936	878	784	778	778	712
J	705	668	648	594	559	521	505	480	476	396	395	341	328
K	325	319	211	199	174	117	108	103	92	75	20	12	6
L	2	38714	25660	22536	19684	12092	11214	10073	7595	7131	6894	5580	5483
M	5456	5122	4519	4825	4009	3835	3821	3761	3712	3688	3676	3573	3520
N	3417	3265	3079	2698	2648	2615	2374	2320	2318	2295	2216	2147	2127
O	2013	1956	1829	1810	1770	1723	1712	1661	1611	1455	1354	1340	1300
P	1295	1192	1185	1135	1115	1056	1049	1012	979	920	900	888	884
Q	747	652	646	623	609	531	505	474	426	415	357	346	344
R	266	247	220	169	161	136	126	116	115	113	106	100	88
S	52	67	56	46	33	30	16	7	5	2	33293	10828	10777
T	10319	9137	7858	7018	6334	5404	4851	4776	4687	4353	4323	4155	3730
U	3720	3664	3424	3115	3074	2699	2649	2434	2331	2305	2283	2212	2108
V	2015	1968	1944	1938	1924	1907	1854	1841	1838	1516	1376	1223	1193
W	1103	1095	1073	1072	946	911	841	829	801	791	700	663	627
X	620	609	605	601	595	593	571	526	508	435	401	388	326
Y	299	285	282	265	249	240	238	224	222	207	207	194	174
Z	172	151	150	123	98	91	39	89	70	57	27	21	8
	7		2	1	13734	7891	6631	5609	5263	5108	4573	4259	3921
	3831	3550	3286	2958	2655	2592	2579	2175	1931	1819	1787	1774	1650
	1601	1458	1313	1278	1267	1250	1188	1144	1139	1081	1080	1041	998
	373	371	391	350	319	295	282	275	231	218	478	471	413
	371	363	354	315	307	238	198	194	187	171	170	152	143
	116	114	92	58	51	50	16	16	13	13	12	5	20520
	9355	7630	6072	5080	3912	3451	3400	3001	2485	2426	1869	1697	1440
	1396	1298	1251	1210	1118	1102	928	922	793	785	771	541	516
	547	454	408	405	396	393	384	378	266	259	221	215	210
	195	159	142	92	33	58	57	56	31	27	19	12	5
	4	3	2	3769	6800	4661	4560	4392	4198	2816	2572	2433	1912
	1872	1670	1617	1485	1432	1376	1240	1212	1155	1054	875	840	737
	541	604	596	434	393	378	343	340	340	215	177	169	145
	112	104	97	65	46	44	44	35	24	24	18	16	16
	15	15	7	5	5003	4273	3046	2874	2084	1989	1899	1560	1509
	929	929	381	764	747	735	722	574	550	465	463	377	369
	344	311	278	194	190	180	116	98	58	31	30	14	5
	2196	2078	1943	1466	1336	748	623	462	440	339	220	198	195
	170	149	148	142	91	51	56	40	37	36	34	29	21
	20	16	12	11	1	1194	1169	1141	1087	798	777	759	722
	1570	599	556	259	237	194	167	150	119	116	31	53	39
	13	1	3	1793	1558	1397	534	465	454	355	332	224	221
	85	56	34	32	26	24	13	10	8	4	2	3722	775
	605	223	101	35	21	14	2	379	554	479	364	199	174
	173	157	120	118	37	32	45	10	1004	186	122	30	443
	291	47	28	27	24	7	2	1348	369	62	31	28	5
	256	23	1137	349	19	2	30	4	195	17	31		

TABLE 4-6

PERCENTAGE FREQUENCY DISTRIBUTIONS OF THE FIRST SET OF FIFTY RADICALS

RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT
1	CK (口)	2.97 %	2	AN (一)	2.49 %	3	FO (日)	2.48 %	4	JK (白)	2.13 %
5	AA (一)	2.11 %	6	AO (丿)	1.81 %	7	AB (丶)	1.76 %	8	FP (木)	1.64 %
9	CL (彡)	1.49 %	10	FQ (月)	1.44 %	11	PZ (言)	1.31 %	12	FR (辶)	1.26 %
13	CM (口)	1.08 %	14	CN (寸)	1.03 %	15	CO (山)	0.95 %	16	CP (女)	0.94 %
17	NE (糸)	0.88 %	18	CQ (才)	0.79 %	19	FS (王)	0.77 %	20	CR (人)	0.77 %
21	CS (也)	0.76 %	22	CT (丩)	0.75 %	23	CU (廿)	0.73 %	24	FT (文)	0.72 %
25	AP (十)	0.71 %	26	JL (禾)	0.69 %	27	JM (疋)	0.69 %	28	CV (子)	0.69 %
29	JN (立)	0.66 %	30	CW (夕)	0.65 %	31	AQ (ナ)	0.65 %	32	CA (大)	0.65 %
33	AR (亅)	0.65 %	34	FU (心)	0.65 %	35	AS (匕)	0.63 %	36	SD (門)	0.63 %
37	CY (士)	0.62 %	38	CZ (彳)	0.62 %	39	AT (亠)	0.61 %	40	QA (我)	0.60 %
41	JO (田)	0.59 %	42	AU (力)	0.56 %	43	DA (父)	0.55 %	44	DB (小)	0.53 %
45	AV (丷)	0.52 %	46	DC (广)	0.52 %	47	DD (山)	0.51 %	48	NF (竹)	0.51 %
49	JP (古)	0.50 %	50	DE (工)	0.49 %						

ACCUMULATION = 48.77 %

TABLE 4-7

PERCENTAGE FREQUENCY DISTRIBUTIONS OF THE SECOND SET OF FIFTY RADICALS

RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT
51	DF (幺)	0.49 %	52	QB (貝)	0.49 %	53	AW (人)	0.49 %	54	FV (戈)	0.49 %
55	AX (了)	0.47 %	56	FW (方)	0.46 %	57	DG (口)	0.45 %	58	JQ (目)	0.45 %
59	AY (一)	0.45 %	60	FX (不)	0.44 %	61	DH (巾)	0.44 %	62	SE (佳)	0.44 %
63	DI (步)	0.43 %	64	NG (庄)	0.42 %	65	NH (西)	0.42 %	66	AZ (儿)	0.42 %
67	JR (可)	0.41 %	68	QC (車)	0.39 %	69	BA (又)	0.36 %	70	BB (二)	0.36 %
71	FY (受)	0.36 %	72	BC (人)	0.35 %	73	FZ (伙)	0.35 %	74	GA (百)	0.35 %
75	JS (吉)	0.35 %	76	DJ (止)	0.34 %	77	NI (至)	0.34 %	78	GB (斤)	0.33 %
79	NJ (生)	0.33 %	80	QD (里)	0.33 %	81	UE (頁)	0.32 %	82	JT (示)	0.31 %
83	JU (四)	0.31 %	84	JV (去)	0.30 %	85	SF (者)	0.30 %	86	NK (自)	0.29 %
87	SG (金)	0.29 %	88	DK (上)	0.29 %	89	GC (主)	0.29 %	90	BD (一)	0.29 %
91	SH (來)	0.28 %	92	JW (生)	0.28 %	93	DL (弓)	0.28 %	94	JX (用)	0.28 %
95	UF (重)	0.27 %	96	NL (艮)	0.27 %	97	GD (中)	0.27 %	98	BE (么)	0.27 %
99	JY (母)	0.27 %	100	GE (巴)	0.26 %						

ACCUMULATION = 66.67 %

TABLE 4-8

PERCENTAGE FREQUENCY DISTRIBUTIONS OF THE THIRD SET OF FIFTY RADICALS

RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT
101	DM (三)	0.26 %	102	DN (巾)	0.25 %	103	NM (四)	0.25 %	104	DO (土)	0.25 %
105	QE (見)	0.25 %	106	GF (火)	0.25 %	107	NN (米)	0.25 %	108	GG (川)	0.24 %
109	GH (天)	0.24 %	110	JZ (戊)	0.24 %	111	YL (組)	0.24 %	112	KA (业)	0.24 %
113	GI (牛)	0.24 %	114	GJ (冫)	0.24 %	115	GK (戶)	0.24 %	116	BF (彡)	0.24 %
117	KB (以)	0.23 %	118	BG (冂)	0.23 %	119	BH (八)	0.23 %	120	GL (产)	0.23 %
121	AC (冫)	0.23 %	122	NO (虫)	0.23 %	123	GM (尤)	0.23 %	124	QF (豆)	0.22 %
125	KC (乍)	0.22 %	126	GN (五)	0.22 %	127	QG (豕)	0.22 %	128	NP (聿)	0.21 %
129	GO (止)	0.21 %	130	DP (尸)	0.20 %	131	KD (四)	0.20 %	132	GP (犬)	0.20 %
133	KE (弟)	0.20 %	134	UG (馬)	0.20 %	135	QH (足)	0.19 %	136	SI (尚)	0.19 %
137	NQ (交)	0.19 %	138	BI (几)	0.19 %	139	DQ (乡)	0.19 %	140	DR (子)	0.18 %
141	UH (馬)	0.18 %	142	SJ (雨)	0.18 %	143	KF (矢)	0.17 %	144	GQ (开)	0.17 %
145	NR (回)	0.17 %	146	KG (穴)	0.17 %	147	GR (欠)	0.17 %	148	GS (甘)	0.17 %
149	NS (虎)	0.17 %	150	NT (耳)	0.17 %						

ACCUMULATION = 77.32 %

TABLE 4-9

PERCENTAGE FREQUENCY DISTRIBUTIONS OF THE FOURTH SET OF FIFTY RADICALS

RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT
151	SK (其)	0.16 %	152	BJ (刀)	0.16 %	153	QI (那)	0.16 %	154	DS (已)	0.16 %
155	BK (卩)	0.16 %	156	KH (皿)	0.16 %	157	SL (長)	0.16 %	158	QJ (走)	0.16 %
159	BL (マ)	0.15 %	160	GT (水)	0.15 %	161	KI (石)	0.15 %	162	GU (戈)	0.15 %
163	GV (元)	0.15 %	164	KJ (冊)	0.15 %	165	DT (千)	0.15 %	166	GW (手)	0.15 %
167	KK (夂)	0.15 %	168	BH (卜)	0.15 %	169	BN (厂)	0.15 %	170	GX (分)	0.14 %
171	KL (正)	0.14 %	172	DU (《)	0.14 %	173	VN (祿)	0.14 %	174	NU (白)	0.14 %
175	DV (下)	0.14 %	176	GY (𠂔)	0.14 %	177	CZ (丰)	0.14 %	178	KM (尔)	0.14 %
179	VO (能)	0.13 %	180	UI (高)	0.13 %	181	DW (仝)	0.13 %	182	KN (民)	0.13 %
183	HA (少)	0.13 %	184	BO (夕)	0.13 %	185	UJ (看)	0.13 %	186	BP (九)	0.13 %
187	KO (且)	0.13 %	188	HB (𠂔)	0.13 %	189	KP (皮)	0.12 %	190	VP (纟)	0.12 %
191	KQ (永)	0.12 %	192	NV (𠂔)	0.12 %	193	KR (旦)	0.12 %	194	SM (取)	0.12 %
195	KS (冉)	0.12 %	196	UK (面)	0.12 %	197	SN (東)	0.12 %	198	CK (𠂔)	0.12 %
199	KT (衣)	0.12 %	200	DX (士)	0.12 %						

ACCUMULATION = 84.23 %

TABLE 4-10

FREQUENCY OF RADICAL POSITIONS IN DESCENDING ORDER IN THE 4864 CHARACTERS.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	CL	FT	CU	CK	BC	GX	FR	NP	DC	CK	AO	FO	SD	DO	QI	AE	CY
2	CO	AN	CC	FO	CM	GA	EB	QC	DP	KJ	FY	DC	BC	GA	VS	AO	HG
3	AN	CT	FO	FP	BY	JP	QJ	BS	KY	AS	NJ	NO	JZ	UP	AX	AF	AB
4	FP	SE	CR	FU	CE	EX	EN	CM	BN	DG	AC	GA	LI	BW	CY	JZ	BR
5	CA	JE	NF	FC	MP	CM	VK	NL	NS	DH	OG	AP	OZ	FC	CI	QC	GO
6	JG	GR	AA	GB	CG	FP	IK	NH	GK	BA	VP	BF	OS	LJ	DK	TC	DZ
7	NE	AU	AY	CG	FE	FS	JA	NZ	AQ	BE	EN	NW	PC	BF	FO	AK	AH
8	PI	FC	JO	KH	AG	DH	JR	UI	HY	GF	SK	OT	VZ	EA	GD	IU	CE
9	FL	GB	DU	AP	BI	QQ	JE	BI	CL	IR	CG	CU	YA	CH	CI	OE	ER
10	DN	CM	QJ	CA	AA	AM	JJ	KV	IL	BI	OR	CL	FE	BE	HA	MY	EA
11	CP	FY	BL	CP	AB	AZ	WP	OR	OA	GP	BB	DE	EM	FP	HG	AA	EB
12	DG	QL	CA	GC	AC	CE	AE	BR	CC	NI	GU	QC	EP	JL	HY	AB	JF
13	FS	BK	JN	AA	AD	BE	AL	CY	EH	SE	AA	AK	KA	JT	IC	AC	LK
14	DI	AS	DA	DO	AE	OG	AZ	DU	JC	SR	AB	BE	BN	OQ	IT	AD	QT
15	NO	DO	AT	CM	AF	EZ	FL	FA	LW	BW	AD	FP	JB	AU	EI	AG	VZ
16	GF	BA	AV	CI	AG	GB	JD	FF	AF	JP	AE	FS	MY	BA	KL	AM	AI
17	CT	NZ	JU	AZ	AN	NW	SB	GB	PH	JT	AF	GG	TJ	BJ	LC	AJ	AC
18	AI	BW	SJ	UN	AI	IN	SC	HL	SA	NV	AG	GZ	AA	CP	NW	AJ	AD
19	JL	GU	JK	JT	AJ	JL	TU	NT	AA	OM	AN	JG	AB	FO	NY	AL	AE
20	OM	CK	JS	BC	AK	JO	TI	IA	AB	WA	AI	OR	AC	FS	ON	AM	AF
21	CI	FM	BE	NE	AL	KF	AA	JK	AC	DO	AJ	OD	AD	FU	PD	AN	AG
22	JQ	GP	DJ	BD	AM	NA	AB	LD	AD	FQ	KE	QT	AE	HO	CC	AP	AI
23	QC	KP	BM	BA	AN	QT	AC	LX	AE	FZ	AL	SE	AF	PJ	OE	AQ	AJ
24	ED	AI	GC	DE	AP	SU	AD	NH	AG	CA	AN	AA	AG	RG	OM	AR	AK
25	FO	JP	KG	CV	AO	TL	AF	RR	AN	HQ	AN	AB	AN	SE	OB	AS	AL
26	SV	LD	NM	DD	AR	UD	AG	OE	AI	IM	AP	AC	AI	UG	QX	AT	AM
27	JT	OM	CT	AM	AS	VT	AM	PO	AJ	JO	AO	AD	AJ	AB	SL	AU	AN
28	KT	UM	EP	JO	AT	AA	AI	PI	AK	KF	AB	KE	AK	AP	TJ	AV	AO
29	GB	EG	BC	GF	AU	AB	AJ	GF	AL	OC	AS	AF	AL	AM	UF	AM	AP
30	UG	FS	SI	FM	AV	AC	AK	QC	AM	OC	AT	AC	AM	CK	UN	AX	AO
31	CM	MA	BJ	DB	AM	AD	AM	QZ	AN	QD	AU	AN	AN	CM	UJ	AT	AR
32	NH	JK	NH	SE	AI	AE	AB	SE	AO	OF	AV	AI	AO	OT	UN	AZ	AS
33	VU	NL	JL	AS	AT	AF	AO	ST	AP	AM	AM	AJ	AP	EF	VC	BA	AT
34	GO	NO	NX	FS	AZ	AG	AP	UT	AR	CD	AX	AL	AQ	EI	VW	BB	AU
35	BF	QD	SB	NB	BA	AM	AQ	VA	AS	CV	AT	AM	AB	GO	II	BC	AV
36	NT	SF	EU	JU	BB	AI	AR	VB	AT	DE	AZ	AN	AS	CV	YC	BD	AM
37	OS	GF	GS	DF	BC	AJ	AS	VT	AU	DO	BA	AO	AT	HC	IP	BE	AI
38	DL	GI	NJ	JX	BD	AK	AT	KG	AV	EN	BB	AO	AU	II	IA	BF	AT
39	UY	QE	OT	NX	BE	AL	AU	XV	AM	EZ	BC	AR	AV	JO	IJ	BC	AZ
40	DD	OT	OC	BH	BF	AM	AV	AB	AX	FP	BD	AS	AM	MA	AA	BM	BA
41	HA	VA	OT	BI	BN	AN	AM	AN	AT	FW	BE	AT	AX	NO	AG	BI	BB
42	DH	DF	BL	FZ	BI	AG	AX	AC	AZ	FY	BF	AU	AT	NT	AP	BJ	BC
43	FW	ET	DO	JR	BJ	AP	AT	AD	BA	GE	BC	AV	AZ	NU	AU	BK	BD
44	ST	FP	BO	NH	BK	AQ	BA	AE	BB	GT	BN	AM	BA	NV	AM	BL	BE
45	DF	NT	DU	DA	BL	AR	BB	AF	BC	IA	BI	AZ	BB	OK	BA	BM	BF
46	NW	VG	QO	ER	BN	AS	BC	AG	BD	IC	BJ	AT	BD	OM	BB	BN	BG
47	UJ	VU	FP	GF	BN	AT	BD	AN	BE	IM	BK	AZ	BE	GB	BI	BO	BH
48	AB	XU	GA	JT	BO	AU	BE	AI	BF	JZ	BL	BA	BF	OF	BJ	BP	BI
49	AU	BJ	ID	LJ	BP	AV	BF	AJ	BC	KL	BN	BB	BC	GG	BP	BQ	BJ
50	DR	BT	IC	GV	BQ	AX	BG	AK	BM	KO	BN	BC	BI	EA	BQ	BR	BK

TABLE 4-11

FREQUENCY OF RADICAL POSITIONS IN DESCENDING ORDER OVER 753,941 SAMPLES

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	AN	AR	FO	CK	CH	JP	FR	PZ	AQ	FG	FY	NN	SD	BF	AA	AD	CT
2	AB	FT	CO	AA	BC	GA	OJ	UI	DC	AS	VP	FO	JZ	GQ	QA	AF	NG
3	JK	CS	CK	CH	HP	CI	EB	SE	GL	KJ	HJ	GA	BC	FO	AX	AE	EA
4	CL	CK	CR	FP	BY	CV	EK	NP	DP	DH	OO	DE	KK	CK	FX	WY	EN
5	PZ	CT	CU	FO	CE	BI	UR	BI	NS	IN	AO	NO	LI	DO	NC	IU	GO
6	FP	FY	AT	JM	CG	KF	JA	QC	BN	BA	SI	CK	OZ	GA	AW	AK	AB
7	CO	AS	MF	FU	FE	SU	IK	ON	OK	CK	AC	FS	PC	BW	CI	OE	BN
8	NE	UE	AA	AZ	BI	VT	AE	GB	GK	BI	OR	OT	OS	UP	AP	JZ	WZ
9	CZ	CW	JM	OB	AO	UO	JD	NL	KY	LO	EM	BF	VZ	JT	BB	OC	LK
10	JL	SD	AY	CP	AA	OQ	TU	LX	HY	DG	NB	OC	FE	EA	SH	TC	EB
11	CP	GB	CY	FS	AB	JL	JE	NZ	LW	FZ	GU	CU	BN	AU	DK	AA	JV
12	DI	SE	DJ	DB	AC	CE	VK	KV	CC	BE	CD	OB	EP	LJ	DM	AB	DZ
13	FO	NL	NJ	FQ	AD	FP	AL	XW	IL	NI	AA	AP	JB	MT	GD	AC	AN
14	CT	FQ	AV	CV	AE	AZ	FL	OZ	EN	FW	AB	QT	EM	JL	KB	AD	CE
15	FQ	AU	JS	DM	AF	FS	WP	OX	FM	GF	AD	FP	TR	OO	GN	AG	OT
16	FS	OM	DA	FZ	AG	BE	TI	NH	JC	JP	AE	JO	WT	AW	KD	AN	AA
17	CK	GR	NH	AP	AN	AW	SB	OG	SA	DE	AF	SE	TJ	BE	JW	AI	AC
18	NI	GE	JO	JO	AI	GB	AZ	JK	AF	OF	AG	DG	AA	GH	UN	AJ	AD
19	DN	KC	GC	DA	AJ	QT	JJ	XG	AA	SR	AN	BE	AB	PJ	GN	AL	AE
20	SG	BK	CW	GG	AK	DN	SC	NL	AB	EN	AI	GX	AC	EP	JX	AN	AF
21	DL	CV	YL	JQ	AL	DG	AA	NH	AC	SE	AJ	GG	AD	AP	CV	AN	AG
22	DG	NG	NH	CX	AM	TL	AB	CY	AD	DQ	AK	AR	AE	BJ	DB	AP	AI
23	QH	GE	GJ	JY	AN	NH	AC	CH	AE	IH	AL	OD	AF	CH	JR	AQ	AJ
24	FW	KH	JK	CW	AP	JO	AD	DU	AG	RC	AM	AA	AG	NO	JV	AR	AK
25	SF	JR	JU	GI	AO	MA	AF	BS	AN	KF	AN	AB	AN	EI	CS	AS	AL
26	AC	JP	DD	OD	AR	EZ	AG	VT	AI	QC	AP	AC	AI	FQ	QI	AT	AM
27	JT	JV	SI	OG	AS	IN	AN	ST	AJ	CV	AO	AD	AJ	BA	DV	AU	AN
28	QC	AP	BD	AV	AT	AA	AI	FA	AK	IC	AR	AE	AK	GW	FO	AV	AO
29	GY	UF	KA	DD	AU	AB	AJ	LO	AL	VA	AS	AF	AL	FU	UJ	AW	AP
30	DW	GP	GS	KE	AV	AC	AK	NR	AM	GP	AT	AG	AM	FS	KN	AI	AO
31	GO	JH	BC	DE	AM	AD	AM	OF	AN	GA	AU	AN	AN	FP	NH	AT	AR
32	NB	JQ	SJ	DF	AX	AE	AN	UY	AO	FP	AY	AI	AO	II	FW	AZ	AS
33	AM	DS	BM	NH	AY	AF	AO	HT	AP	JO	AW	AJ	AP	UO	SL	BA	AT
34	KY	UG	DG	BE	AZ	AG	AP	PQ	AR	JT	AX	AL	AQ	UG	HD	BB	AU
35	DI	KP	YN	BA	BA	AN	AQ	VA	AS	XW	AT	AM	AR	JO	KU	BC	AV
36	CW	DE	DF	AU	BB	AI	AR	FF	AT	KF	AZ	AN	AS	HO	UR	BD	AM
37	BF	DF	BO	DN	BC	AJ	AS	BR	AU	FT	BA	AO	AT	VT	NY	BE	AX
38	KI	DO	KG	NK	BD	AK	AT	IA	AV	OC	BB	AQ	AU	AB	VO	BF	AT
39	GR	KV	DT	OF	BE	AL	AU	VB	AW	NV	BC	AR	AY	NA	GT	BG	AZ
40	DF	XS	BN	NE	BF	AM	AY	AA	AX	SF	BD	AS	AW	OF	SP	BN	BA
41	AU	HK	NU	XS	BN	AM	AM	AB	AT	IA	BE	AT	AX	RA	UL	BI	BB
42	NH	BS	NP	QC	BI	AO	AX	AC	AZ	SJ	BF	AU	AY	SE	SN	BJ	BC
43	UF	UN	NH	BD	BJ	AP	AT	AD	BA	UT	BG	AY	AZ	CP	GX	BK	BD
44	NO	NH	NW	NX	BK	AQ	BA	AE	BB	KL	BN	AN	BA	NU	NK	BL	BE
45	GF	CH	DO	DO	BL	AR	BB	AF	BC	XB	BI	AX	BB	RG	BQ	BN	BF
46	DE	QO	SO	JT	BN	AS	BC	AG	BD	OY	BJ	AT	BD	DT	FQ	BN	BG
47	SK	GU	BE	DU	BN	AT	BD	AN	BE	BW	BK	AZ	BE	HC	BR	BO	BH
48	HE	XO	BJ	BN	BO	AU	BE	AI	BF	NL	BL	BA	BF	NY	SO	BF	BI
49	NZ	HF	HC	KQ	BF	AV	BF	AJ	BC	GT	BN	BB	BG	OK	VO	BO	BJ
50	QO	BA	BL	NR	BO	AX	BG	AX	BN	ON	BN	BC	BI	ON	BP	BR	BK

TABLE 4-12



### IV.3 Radical Search Time

An analysis of the time required to search each radical is useful since one could rearrange the radicals' positions in such a way that the most frequently used radicals can be placed in the optimal positions. The results of the analysis for the 4864 characters and 753,941 samples are shown in TABLE 4-13 and TABLE 4-18 respectively. The time required of each radical in TABLE 4-18 is derived from the time required in TABLE 4-13 multiplying corresponding frequency of occurrence in TABLE 4-6. The percentage frequency distributions of the first, second, third, and fourth sets of fifty radicals in descending order analyzed for the 4864 characters and 753,941 samples are presented in TABLES 4-14, 4-15, 4-16, 4-17, AND TABLES 4-19, 4-20, 4-21, 4-22 respectively. The information contained in TABLE 4-6 can be used for optimizing purpose. For example, radical QA (我) in group 10 has the occurrence of 9355 times and QX (角) in the same group has the occurrence of only 771 times. The search time required for the former is 24 ms while the search time for the latter is 21 ms. Some optimization could be done to reduce the total radical search time.

The total computer time spent to generate the 4864 most frequently used characters and the 753,941 samples for the vocabulary of 4864 characters are 16.951 seconds and 7 hours

7 minutes and 0.554 seconds respectively.

# SEARCH TIME OF RADICALS OF 864 CHARACTERS

	A	B	C	D	E	F	G	H	I	J	K	L	M
	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
A	3	4	8	7	3	3	15	3	10	5	6	8	5
	9	15	7	12	6	12	9	8	7	6	15	7	15
B	7	7	8	9	10	11	10	7	18	11	10	18	11
	8	15	17	7	14	5	7	8	8	16	9	9	13
C	9	14	9	9	3	18	15	15	5	16	14	10	11
	10	12	15	13	17	17	13	11	15	16	9	5	18
D	14	10	19	10	21	8	15	11	8	18	9	20	11
	11	9	12	15	15	15	12	9	15	18	15	13	12
E	16	16	12	8	12	21	14	13	19	22	8	16	21
	12	8	9	12	10	19	13	18	15	16	15	22	16
F	14	18	22	13	19	13	11	12	16	16	15	11	9
	10	13	13	14	19	12	15	18	16	12	14	20	18
G	12	31	17	20	20	12	15	17	14	10	22	18	21
	14	13	14	15	10	12	18	13	21	19	23	18	14
H	7	22	12	17	17	15	17	10	14	19	19	20	12
	24	18	16	20	23	20	12	21	23	14	12	18	17
I	18	22	11	18	20	17	15	17	13	25	22	20	14
	21	11	22	18	17	15	24	17	13	12	14	18	22
J	21	19	20	22	17	21	18	17	18	21	15	29	23
	23	22	17	18	15	26	13	22	25	20	18	22	13
K	15	18	20	20	22	16	20	21	20	19	21	18	22
	21	16	21	19	17	18	23	26	23	20	36	16	16
L	16	16	17	19	18	19	15	28	12	14	21	23	18
	10	17	17	22	15	20	24	16	20	16	18	22	26
M	23	19	23	17	14	14	22	24	30	24	21	19	22
	16	17	20	20	14	16	14	19	21	18	25	22	29
N	19	29	17	20	18	23	26	20	27	18	25	20	20
	21	19	23	26	27	30	18	19	29	25	29	21	32
O	26	17	16	18	25	18	30	21	25	25	18	18	19
	22	24	25	23	24	26	21	26	29	20	21	29	20
P	25	22	21	25	23	10	32	24	25	21	25	26	24
	31	18	21	25	20	26	17	20	21	23	22	21	21
Q	24	24	22	24	29	23	29	33	22	29	21	23	28
	30	26	26	28	25	24	25	28	27	26	21	31	20
R	24	27	22	26	24	27	27	24	32	28	26	29	25
	31	25	33	30	33	23	25	23	32	21	21	29	28
S	23	23	27	21	22	32	26	29	29	24	25	32	25
	28	34	30	23	32	32	31	28	3	27	29	26	29
T	28	25	35	26	32	27	36	44	24	28	27	32	30
	25	27	24	34	24	28	25	29	25	25	26	29	30
U	33	26	27	34	24	29	30	33	36	27	30	28	38
	30	30	32	38	32	33	40	34	33	33	40	24	48
V	35	26	35	30	46	37	23	25	40	34	21	35	38
	32	40	34	34	35	32	52	40	36	38	38	39	42
W	38	44	39	41	47	39	51	44	44	29	37	35	33
	45	37	41	38	35	45	34	51	58	47	38	43	39
X	17	39	33	36	39	36	38	34	37	42	40	45	32
	34	44	50	39	41	43	39	42	47	45	47	46	22
Y	40	40	36	25	33	55	51	39	42	40	40	45	48
	44	52	42	47	48	46	35	49	45	46	52	48	41
Z	46	56	50	48	51	50	49	50	53	54	41	53	49
	52	50	53	53	57	53	56	58	54	44	52	55	51
AT	71	52	45	3	59	65	59	49	56	45	22		

TOTAL SEARCH TIME OF 864 CHARACTERS = 6351 = 3 HOURS 3 MINUTES 16.35 SECONDS

PERCENTAGE FREQUENCY DISTRIBUTIONS OF THE FIRST SET OF FIFTY RADICALS

RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT
1	ZQ (龜)	0.46 %	2	II (屬)	0.45 %	3	IG (競)	0.44 %	4	ZV (裏)	0.44 %
5	ZZ (與)	0.42 %	6	IA (藏)	0.42 %	7	IE (瓊)	0.41 %	8	ZT (亞)	0.39 %
9	IC (繼)	0.38 %	10	IF (澀)	0.38 %	11	ZL (晶)	0.37 %	12	YX (繼)	0.37 %
13	ZX (爵)	0.37 %	14	IB (函)	0.37 %	15	ZK (齒)	0.36 %	16	ZJ (慶)	0.35 %
17	WV (組)	0.34 %	18	ZU (覆)	0.34 %	19	ZR (義)	0.34 %	20	ZB (黑)	0.33 %
21	YF (傘)	0.32 %	22	ZY (傘)	0.32 %	23	ZI (寫)	0.31 %	24	ZP (燕)	0.31 %
25	ZS (樹)	0.31 %	26	VT (章)	0.31 %	27	YO (歲)	0.31 %	28	ZM (裏)	0.31 %
29	WG (晉)	0.30 %	30	WU (魚)	0.30 %	31	YG (林)	0.30 %	32	ZE (嘉)	0.30 %
33	XP (彪)	0.29 %	34	ZC (肅)	0.29 %	35	ZF (隸)	0.29 %	36	ZH (裏)	0.29 %
37	ZO (蓄)	0.29 %	38	YU (臺)	0.29 %	39	ZG (惡)	0.29 %	40	ZM (龍)	0.29 %
41	IH (慶)	0.29 %	42	UZ (垂)	0.28 %	43	YM (愈)	0.28 %	44	YR (凡)	0.28 %
45	YY (寧)	0.28 %	46	ZD (壽)	0.28 %	47	ZW (寬)	0.28 %	48	WE (弱)	0.28 %
49	WW (繼)	0.28 %	50	XV (喜)	0.28 %						

ACCUMULATION = 16.59 %

TABLE 4-14

PERCENTAGE FREQUENCY DISTRIBUTIONS OF THE SECOND SET OF FIFTY RADICALS

RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT
51	XX (商)	0.28 %	52	YQ (資)	0.28 %	53	VE (段)	0.27 %	54	XY (莫)	0.27 %
55	YS (鼠)	0.27 %	56	YW (齊)	0.27 %	57	ZA (賓)	0.27 %	58	WN (哀)	0.27 %
59	WS (從)	0.27 %	60	XL (哀)	0.27 %	61	XW (素)	0.27 %	62	YL (組)	0.27 %
63	YT (鼎)	0.27 %	64	YV (圖)	0.27 %	65	1J (器)	0.27 %	66	TH (武)	0.26 %
67	WB (鳥)	0.26 %	68	WH (罪)	0.26 %	69	WI (蜀)	0.26 %	70	XO (兜)	0.26 %
71	YN (網)	0.26 %	72	WY (設)	0.25 %	73	XS (惠)	0.25 %	74	VZ (鬥)	0.25 %
75	XJ (鹿)	0.25 %	76	XU (堯)	0.25 %	77	YI (堯)	0.25 %	78	YP (匪)	0.25 %
79	VK (風)	0.24 %	80	WD (崔)	0.24 %	81	WP (鬼)	0.24 %	82	XR (黃)	0.24 %
83	YZ (厭)	0.24 %	84	UT (風)	0.24 %	85	UX (疾)	0.24 %	86	VI (索)	0.24 %
87	VO (能)	0.24 %	88	VU (鬼)	0.24 %	89	XK (變)	0.24 %	90	YA (業)	0.24 %
91	YB (尋)	0.24 %	92	YJ (齊)	0.24 %	93	YK (棘)	0.24 %	94	VY (旣)	0.23 %
95	WC (冢)	0.23 %	96	WF (素)	0.23 %	97	WZ (鳥)	0.23 %	98	XB (暈)	0.23 %
99	XE (寅)	0.23 %	100	XQ (黑)	0.23 %						

ACCUMULATION = 29.11 %

TABLE 4-15

PERCENTAGE FREQUENCY DISTRIBUTIONS OF THE THIRD SET OF FIFTY RADICALS

RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT
101	XT (區)	0.23 %	102	YH (壹)	0.23 %	103	UM (易)	0.22 %	104	UQ (直)	0.22 %
105	VM (炎)	0.22 %	106	VW (乘)	0.22 %	107	VX (常)	0.22 %	108	WA (蕭)	0.22 %
109	WQ (禹)	0.22 %	110	WX (冀)	0.22 %	111	XG (曾)	0.22 %	112	YE (爽)	0.22 %
113	VF (湯)	0.22 %	114	WK (興)	0.22 %	115	WO (冬)	0.22 %	116	XI (率)	0.22 %
117	KX (生)	0.21 %	118	TG (通)	0.21 %	119	UT (周)	0.21 %	120	VV (商)	0.21 %
121	XD (圖)	0.21 %	122	XF (董)	0.21 %	123	YC (喪)	0.21 %	124	TC (免)	0.21 %
125	VA (昌)	0.21 %	126	VC (湛)	0.21 %	127	VL (亨)	0.21 %	128	VR (骨)	0.21 %
129	WL (端)	0.21 %	130	WR (殘)	0.21 %	131	SO (重)	0.20 %	132	TQ (亮)	0.20 %
133	UD (馬)	0.20 %	134	UU (果)	0.20 %	135	VJ (号)	0.20 %	136	VP (綫)	0.20 %
137	VQ (高)	0.20 %	138	WT (留)	0.20 %	139	XH (曲)	0.20 %	140	XN (官)	0.20 %
141	QH (足)	0.19 %	142	RF (曼)	0.19 %	143	RR (旱)	0.19 %	144	UA (豕)	0.19 %
145	UH (為)	0.19 %	146	US (飛)	0.19 %	147	UV (革)	0.19 %	148	UW (復)	0.19 %
149	WM (重)	0.19 %	150	XC (帶)	0.19 %						

ACCUMULATION = 39.57 %

TABLE 4-16

PERCENTAGE FREQUENCY DISTRIBUTIONS OF THE FOURTH SET OF FIFTY RADICALS

RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT
151	NZ (自)	0.19 %	152	PG (束)	0.19 %	153	RI (县)	0.19 %	154	RV (免)	0.19 %
155	SF (者)	0.19 %	156	SL (長)	0.19 %	157	SR (林)	0.19 %	158	SS (幸)	0.19 %
159	TE (帚)	0.19 %	160	TL (若)	0.19 %	161	UP (東)	0.19 %	162	UR (是)	0.19 %
163	VN (称)	0.19 %	164	VS (隻)	0.19 %	165	XM (章)	0.19 %	166	GB (斤)	0.18 %
167	PN (舅)	0.18 %	168	QY (咼)	0.18 %	169	RN (舅)	0.18 %	170	ST (壺)	0.18 %
171	MI (史)	0.18 %	172	NB (虎)	0.18 %	173	OG (来)	0.18 %	174	QN (身)	0.18 %
175	RQ (字)	0.18 %	176	SP (事)	0.18 %	177	TM (承)	0.18 %	178	TZ (乖)	0.18 %
179	UG (馮)	0.18 %	180	UK (面)	0.18 %	181	UN (食)	0.18 %	182	UO (品)	0.18 %
183	VD (音)	0.18 %	184	JL (木)	0.17 %	185	MZ (勿)	0.17 %	186	NB (苍)	0.17 %
187	XV (共)	0.17 %	188	NI (豕)	0.17 %	189	CV (死)	0.17 %	190	OY (衣)	0.17 %
191	QE (見)	0.17 %	192	QG (豕)	0.17 %	193	QJ (走)	0.17 %	194	RL (吳)	0.17 %
195	RY (巫)	0.17 %	196	SH (來)	0.17 %	197	SI (尚)	0.17 %	198	SX (戔)	0.17 %
199	SZ (五)	0.17 %	200	TU (兒)	0.17 %						

ACCUMULATION = 48.52 %

TABLE 4-17

SEARCH TIME OF RADICAL OVER 753,941 SAMPLES  
(THE TIME REQUIRED IN TABLE 4-11 \* FREQUENCY OCCURRENCE IN TABLE 4-6)

	A	B	C	D	E	F	G	H	I	J	K	L	M
	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
A	98739	109884	23552	11340	4641	4527	9335	3612	3990	1010	306	160	20
B	350127	424665	77987	21200	50534	117744	35221	70040	57330	5666	110775	49063	38820
C	39389	39235	44296	40077	42090	40392	36220	25305	52902	27687	24640	38656	24992
D	18158	20120	33694	11676	21756	8814	3989	11208	3224	8352	7740	5822	3671
E	4689	5804	3582	3510	2192	3456	2010	1050	318	556	549726	211390	35383
F	161170	77876	218930	160654	204969	202657	51905	25004	61040	61696	90846	77936	175212
G	119994	92340	55553	79080	162141	61560	105990	75361	53816	94896	40986	36600	44077
H	43274	15208	35184	43320	63140	37140	27536	9854	32520	37134	27705	20722	17016
I	22368	21568	13464	3472	12588	21273	13286	12168	16682	17248	5224	12320	14952
J	8460	5344	5832	7128	5590	7815	5565	5640	7140	5336	5925	7502	5248
K	4550	5742	4842	2587	2610	1521	1188	1236	1472	1200	300	72	34
L	20	503308	33580	315504	373996	145104	168210	181314	121520	55572	36544	116800	98694
M	65472	58782	7823	39500	50180	46020	57315	51937	51968	36880	30872	54314	71920
N	47838	42445	43106	40470	25480	31380	42732	30160	48678	43605	50968	15646	29779
O	14091	43032	21948	30770	30090	25845	29104	16610	22554	27645	25726	26600	15600
P	31080	21456	18960	22700	25645	21120	2588	21252	22517	12880	10800	15984	15028
Q	3446	4344	7106	11214	12180	3027	7575	3058	5538	10375	7854	5920	4816
R	5586	2717	4840	3042	2737	2040	3024	1972	1495	1356	1696	1800	1936
S	1722	1273	1120	1012	561	530	258	119	30	42	499395	314012	247871
T	237337	201014	133586	26324	35010	40504	53063	105072	117175	37060	77314	31410	48490
U	55800	55952	58480	62300	67628	43184	52980	51114	46620	43795	47943	39816	46376
V	42315	31488	40824	36822	32708	34326	42642	47866	42274	30320	49536	19568	30888
W	17648	17520	18241	20368	17028	17309	12615	23212	3612	11074	14700	15249	11286
X	5200	10353	10285	13222	8925	11860	13704	3416	10160	5960	7218	8536	3476
Y	5477	5475	5486	4505	3486	3360	5235	5375	5660	4968	4347	3686	3628
Z	2752	2567	3000	2460	1372	1456	1424	891	1470	912	575	482	232
AA	133	45	34	20	2472	181493	72406	22180	142101	31944	114325	35180	71420
AB	30451	57450	5578	6908	71685	77760	46422	41325	55999	45475	51823	37254	52300
AC	41626	24736	21008	23004	51675	22500	35640	24024	28475	27025	19440	18738	5962
AD	21406	33304	22275	19550	19656	20670	6422	14950	5399	10360	10038	13659	3250
AE	3275	7986	7434	7875	7061	2380	5336	4656	4675	2531	4250	3952	1432
AF	3596	2052	1932	1700	1220	1300	272	320	273	1299	264	105	40920
AG	224520	53120	133606	121920	113448	93373	38600	49033	52670	70325	39249	39031	40320
AH	18880	13748	12526	33880	27950	26448	25984	23016	21411	20410	16191	9871	2320
AI	13128	2254	3975	10530	3504	10611	10368	3072	3512	7252	5746	5235	5250
AJ	3045	1975	4886	2760	2729	564	575	518	392	567	399	248	40
AK	72	34	54	205149	49600	49152	12580	27368	36942	27584	54300	77356	47300
AL	52416	56780	48510	34155	45624	44032	38440	33936	3240	23458	25375	21440	21372
AM	7445	51100	20860	11284	12575	12006	2148	14960	3160	5020	4779	5408	1550
AN	2800	2908	2328	2210	1104	232	1100	1015	600	400	488	484	480
AO	495	390	169	170	10078	21917	31380	34842	74304	53703	56970	43680	57342
AP	27870	27370	28192	29032	23904	24255	28880	19516	17754	15345	18520	4048	17712
AQ	2040	3086	3730	5820	3740	1640	2568	2450	2720	1094	1230	490	50
AR	72272	32120	58062	49444	46760	23936	32396	18440	5540	12882	3380	7722	3190
AS	1460	5556	5772	5822	2777	2379	2856	1760	5428	1044	1258	1615	593
AT	700	592	492	418	35	5330	29746	58191	57046	27506	29525	22637	29158
AV	11390	22361	8348	3324	3243	3384	5346	5100	4403	4472	3240	2385	248
AW	442	132	150	59927	33471	10071	20825	9530	21333	5975	5604	2304	4862
AX	1400	22400	224	300	388	320	63	130	136	50	30	57490	17200
AY	25620	11556	4242	1645	306	544	30	47971	24930	22034	22692	1552	774
AZ	3958	3792	10000	5664	4437	3100	1209	500	5322	10974	1442	5670	21727
BA	18132	2350	484	2706	168	37	32	3134	27136	3974	2548	1940	426
BB	4175	426	3909	3141	317	10	1000	76	4420	755	732		

TOTAL SEARCH TIME OF 753,941 SAMPLES = 26280794 \* 4098 \* MINUTES 3.998 SECONDS



PERCENTAGE FREQUENCY DISTRIBUTIONS OF THE FIRST SET OF FIFTY RADICALS

RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT
1	CK (口)	2.47 %	2	FO (日)	1.92 %	3	JK (白)	1.90 %	4	PZ (言)	1.64 %
5	AO (冫)	1.62 %	6	FR (辶)	1.42 %	7	AN (亻)	1.33 %	8	FP (木)	1.27 %
9	FQ (月)	1.20 %	10	JL (禾)	1.19 %	11	JH (天)	0.94 %	12	NE (糸)	0.94 %
13	JN (米)	0.90 %	14	CL (彳)	0.88 %	15	QA (我)	0.85 %	16	CP (女)	0.84 %
17	SD (門)	0.78 %	18	CR (人)	0.78 %	19	CS (也)	0.77 %	20	JO (田)	0.76 %
21	CM (口)	0.71 %	22	QB (貝)	0.70 %	23	NF (竹)	0.69 %	24	FU (心)	0.69 %
25	CO (宀)	0.68 %	26	CZ (亻)	0.67 %	27	NG (在)	0.66 %	28	FT (女)	0.64 %
29	YL (纟)	0.64 %	30	DE (工)	0.62 %	31	CW (夕)	0.62 %	32	CN (寸)	0.61 %
33	CV (子)	0.61 %	34	CQ (才)	0.61 %	35	GB (斤)	0.60 %	36	DC (广)	0.59 %
37	CT (卩)	0.58 %	38	SE (隹)	0.57 %	39	SF (耂)	0.57 %	40	FS (王)	0.55 %
41	NI (立)	0.54 %	42	JS (古)	0.53 %	43	QC (車)	0.51 %	44	JP (舌)	0.51 %
45	NH (西)	0.50 %	46	UE (頁)	0.49 %	47	SH (來)	0.48 %	48	JQ (目)	0.48 %
49	CU (艹)	0.48 %	50	UF (重)	0.47 %						

ACCUMULATION = 42.01 %

TABLE 4-19

PERCENTAGE FREQUENCY DISTRIBUTIONS OF THE SECOND SET OF FIFTY RADICALS

RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT
51	QD (里)	0.46 %	52	FV (戈)	0.46 %	53	AQ (尸)	0.46 %	54	DA (夕)	0.46 %
55	SG (金)	0.45 %	56	AS (匕)	0.45 %	57	JV (去)	0.45 %	58	NK (自)	0.44 %
59	QE (見)	0.43 %	60	FY (受)	0.42 %	61	AX (了)	0.42 %	62	AB (、)	0.42 %
63	DG (口)	0.40 %	64	JU (四)	0.40 %	65	QH (足)	0.38 %	66	AZ (儿)	0.38 %
67	AA (一)	0.38 %	68	FZ (代)	0.38 %	69	QG (豕)	0.38 %	70	FX (不)	0.37 %
71	JR (可)	0.36 %	72	DJ (止)	0.36 %	73	UH (焉)	0.36 %	74	NJ (生)	0.35 %
75	JY (母)	0.35 %	76	UG (馬)	0.35 %	77	CX (大)	0.35 %	78	JW (生)	0.33 %
79	SI (尚)	0.33 %	80	DL (弓)	0.33 %	81	FW (方)	0.33 %	82	AT (人)	0.32 %
83	NL (艮)	0.32 %	84	GD (中)	0.32 %	85	VO (能)	0.32 %	86	DB (小)	0.31 %
87	GK (戶)	0.31 %	88	NN (米)	0.31 %	89	GE (巴)	0.31 %	90	QF (豆)	0.30 %
91	DD (山)	0.30 %	92	NM (四)	0.30 %	93	ZU (藿)	0.30 %	94	AP (十)	0.30 %
95	CY (士)	0.30 %	96	SL (長)	0.30 %	97	JX (用)	0.30 %	98	NS (虎)	0.30 %
99	NQ (交)	0.29 %	100	GC (主)	0.29 %						

ACCUMULATION = 59.96 %

TABLE 4-20

PERCENTAGE FREQUENCY DISTRIBUTIONS OF THE THIRD SET OF FIFTY RADICALS

RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT
101	NP (韋)	0.29 %	102	DH (巾)	0.29 %	103	UI (曷)	0.28 %	104	GM (尤)	0.28 %
105	1C (繼)	0.28 %	106	NR (回)	0.27 %	107	QJ (走)	0.27 %	108	VN (秝)	0.27 %
109	AU (力)	0.27 %	110	XQ (黑)	0.27 %	111	KC (乍)	0.26 %	112	KE (弟)	0.26 %
113	SJ (雨)	0.26 %	114	MO (虫)	0.26 %	115	VP (幾)	0.25 %	116	KB (以)	0.25 %
117	GA (百)	0.25 %	118	GL (产)	0.24 %	119	SK (其)	0.24 %	120	GH (天)	0.24 %
121	XR (黃)	0.24 %	122	JT (示)	0.24 %	123	WV (組)	0.24 %	124	KD (四)	0.24 %
125	DF (幺)	0.23 %	126	AR (丩)	0.23 %	127	XS (惠)	0.23 %	128	WU (魚)	0.22 %
129	UM (易)	0.22 %	130	AV (丩)	0.22 %	131	GG (𠂇)	0.22 %	132	UK (面)	0.22 %
133	SO (虫)	0.22 %	134	NV (共)	0.21 %	135	KA (业)	0.21 %	136	QI (那)	0.21 %
137	DI (士)	0.20 %	138	WS (從)	0.20 %	139	UJ (看)	0.20 %	140	ZI (寫)	0.20 %
141	KG (穴)	0.20 %	142	BI (几)	0.20 %	143	NZ (邑)	0.20 %	144	SN (東)	0.20 %
145	GI (牛)	0.20 %	146	NX (豕)	0.20 %	147	KH (皿)	0.19 %	148	GX (分)	0.19 %
149	VQ (高)	0.19 %	150	KX (韭)	0.19 %						

ACCUMULATION = 71.61 %

TABLE 4-21

PERCENTAGE FREQUENCY DISTRIBUTIONS OF THE FOURTH SET OF FIFTY RADICALS

RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT	RANK	CODE	PERCENT
151	AY (一)	0.19 %	152	GV (元)	0.19 %	153	SP (事)	0.18 %	154	JZ (戌)	0.18 %
155	YU (臺)	0.18 %	156	KK (八)	0.18 %	157	KU (本)	0.18 %	158	GN (五)	0.18 %
159	SM (取)	0.18 %	160	VR (骨)	0.18 %	161	KI (石)	0.18 %	162	NT (耳)	0.18 %
163	KM (尔)	0.18 %	164	GF (火)	0.18 %	165	SR (林)	0.17 %	166	AW (人)	0.17 %
167	NW (曲)	0.17 %	168	BC (人)	0.17 %	169	DM (三)	0.17 %	170	SS (辛)	0.17 %
171	KJ (册)	0.17 %	172	UL (南)	0.17 %	173	GW (手)	0.17 %	174	DQ (乡)	0.16 %
175	DN (十)	0.16 %	176	KF (矢)	0.16 %	177	DR (子)	0.16 %	178	GP (犬)	0.16 %
179	HB (月)	0.16 %	180	GZ (水)	0.16 %	181	KT (衣)	0.16 %	182	GO (止)	0.16 %
183	KN (民)	0.16 %	184	XV (由)	0.16 %	185	BE (么)	0.16 %	186	QN (身)	0.16 %
187	QA (而)	0.16 %	188	NU (臼)	0.16 %	189	DK (上)	0.16 %	190	KP (皮)	0.16 %
191	GQ (开)	0.15 %	192	BF ( )	0.15 %	193	QH (更)	0.15 %	194	BD (冂)	0.15 %
195	KL (正)	0.15 %	196	WT (留)	0.15 %	197	BA (又)	0.15 %	198	QK (羊)	0.15 %
199	BB (二)	0.15 %	200	QL (辛)	0.15 %						

ACCUMULATION = 79.93 %

TABLE 4-22

#### IV.4 Frequency of Occurrence of Invoking the Composition Rules

An analysis of the frequency of invoking the composition rules could lead to determining which portion of the software codes should be optimized in order to improve the efficiency of the software system.

TABLE 4-23 shows that composition rules (1), (4), (5), and (2), are the most frequently invoked ones. Furthermore, 43.91 % of the operations involve vertical operation. (rules 1, 2, and 3) and 39.35 % involve horizontal operation (rules 4, 5, and 6).

FREQUENCY OCCURRENCE, PERCENTAGE AND ACCUMULATION OF COMPOSITION RULES

RULE = 1	2170	26.23 %	26.23 %
RULE = 2	1218	14.72 %	40.95 %
RULE = 3	245	2.96 %	43.91 %
RULE = 4	1448	17.50 %	61.41 %
RULE = <del>5</del>	1255	15.17 %	76.58 %
RULE = 6	553	6.68 %	83.26 %
RULE = 7	117	1.41 %	84.67 %
RULE = 8	163	1.97 %	86.64 %
RULE = 9	385	4.65 %	91.30 %
RULE = 10	103	1.24 %	92.54 %
RULE = 11	21	0.25 %	92.80 %
RULE = 12	132	1.60 %	94.39 %
RULE = 13	402	4.86 %	99.25 %
RULE = 14	62	0.75 %	100.00 %
TOTAL =	8274		

TABLE 4-23

#### IV.5 Number of Radicals in a Character

An analysis of the number of radicals in a character from the 4864 character set can show the number of radicals and the composition operation required. One character containing one radical or two radicals uses a single operation rule. Among the 4864 characters, four hundred and two characters are themselves radicals. For example, the character "我" contains only one radical "我". Eighteen hundred and sixty-three characters require two radicals each. Thus, the character "是" contains two radicals FO (日) and JM (疋). Seventeen hundred and eighty-eight characters require three radicals (invoking composition rules twice). For example, the character "個" contains three radicals, AN (亻), CM (口), and JP (古). Eight hundred and eleven characters require four radicals (invoking composition rules three times). For example, the character "國" contains four radicals CM (口), FV (戈), CK (口), and AA (一). The average number of radicals per character is found to be 2.6. In Appendix 7, characters will be grouped according to the number of radicals they contain. The number shown in each category represents the rank of that character. TABLE 4-24 shows the number of characters which contain the same number of radicals.

number of radicals	number of characters
1	402
2	1863
3	1788
4	811

TABLE 4-24 The number of characters which contain the same number of radicals



## CHAPTER V

### CONCLUSION

Subsequent to the presentation of this scheme and its implementation for generating Chinese characters in chapter III, and the discussion of a series of analysis of the scheme, the following conclusions can be drawn.

(1) The software system developed based on this scheme has demonstrated its ability to produce the 4864 most frequently used Chinese characters. This system is also capable of generating many more new characters using the radicals as defined. The system can further be extended to include many more characters by using the appropriate operations to combine the radicals. New ones can be added if required.

(2) The scheme uses two alphanumeric characters to

represent a radical. The scheme is capable of forming an intermediate character whenever required since parentheses are recognized by the system to set up the priority of the processing sequence of composition rules and the inner-most parenthesis is executed first. No priority is assigned to the composition rules, and the console operator is not required to memorize the priority sequence.

(3) The system is implemented using the high level programming language PASCAL and therefore it is easily portable.

(4) The memory size required to store the radicals is only 3.5 K-WORDS which is derived from the following formula.

Total number of strokes \* Number of digits to represent the coordinates of the two end points of the strokes \* Number of bits per digit / Number of digits per word / K-WORDS =  $4463 * 8 * 6 / 60 / 1024 = 3.5$  K-WORDS.

(5) No Chinese keyboard is required.

(6) The presentation of Chinese characters can be improved easily by redefining the coordinates of each radical concerned.

(7) It requires only two hours to train an operator to use the system.

(8) The size of output characters can be altered at will.

(9) Some improvements of the software system could be made according to the analyses presented in chapter IV. For example, the design of the radical table could be changed so that the total radical search time could be optimized for the text of interest. The software code relating to composition rules 1-6 could be optimized if we wish to improve the software efficiency and this improvement could be considered as a research project in the future.

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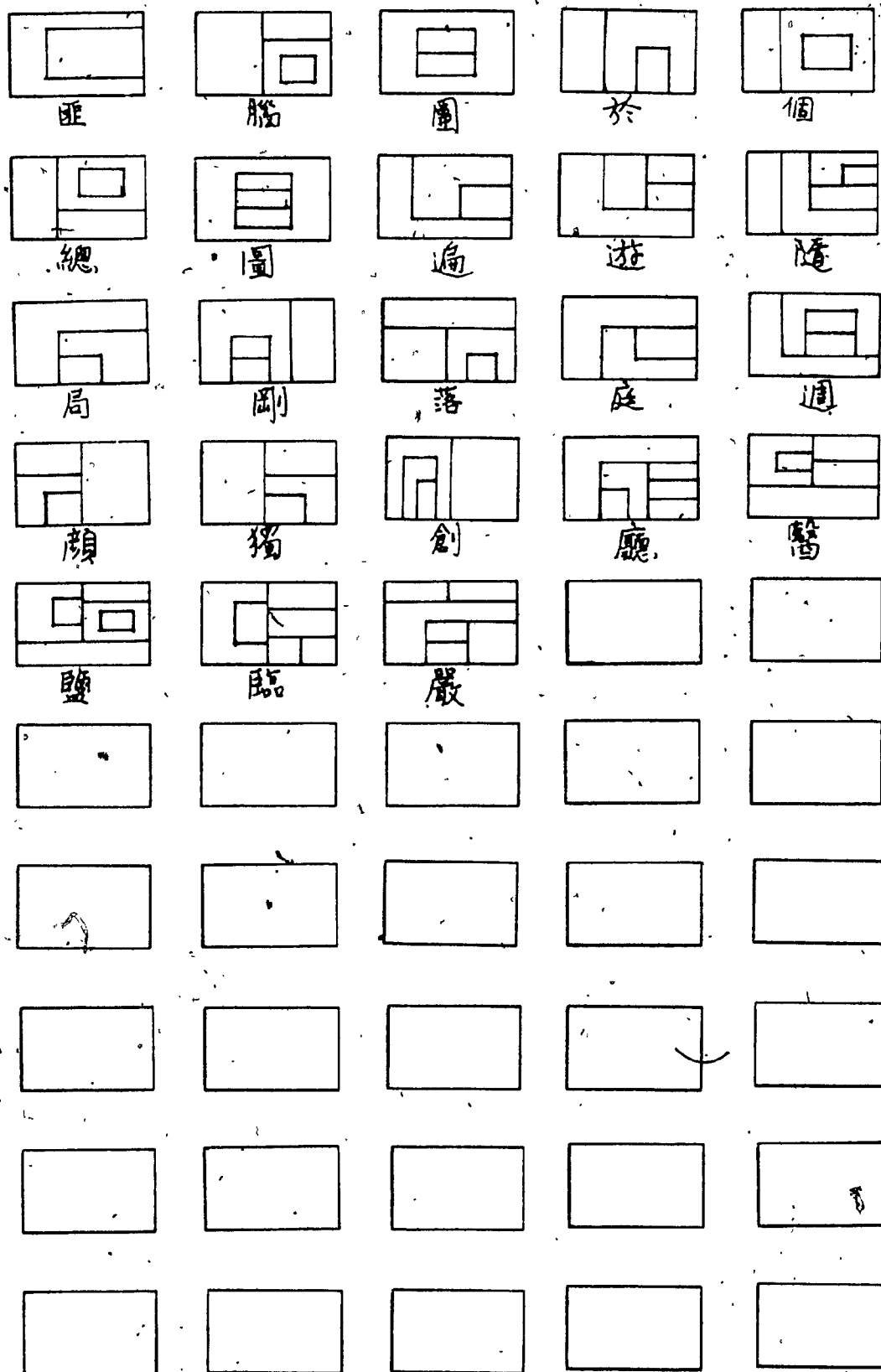
# APPENDIX 1. RADICAL TABLE

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
A	一	、	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	
B	又	二	人	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	
C	入	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	
D	父	小	广	山	工	么	口	巾	巾	巾	巾	巾	巾	巾	巾	巾	巾	巾	巾	巾	巾	巾	巾	巾	巾	
E	丰	及	亡	才	才	才	才	才	才	才	才	才	才	才	才	才	才	才	才	才	才	才	才	才	才	
F	风	瓜	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	
G	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	
H	少	冫	云	六	夕	勿	夫	十	父	气	反	及	央	文	冫	比	世	四	斗	太	代	互	小	瓜	火	
I	介	冫	予	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	
J	元	六	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	
K	业	以	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	
L	平	州	句	包	央	昌	必	牙	天	水	未	半	虫	片	天	只	甘	内	冫	申	艮	丘	尹	术	足	
M	甲	戌	巨	乎	左	无	斥	另	史	瓦	玉	册	父	里	虫	囚	友	事	丰	未	正	步	互	水	冫	
N	巾	衣	冫	北	系	竹	在	西	至	羊	自	艮	田	虫	聿	交	回	耳	外	耳	耳	耳	耳	耳	耳	
O	而	衣	冫	亥	先	辛	未	四	口	舟	羊	吏	圭	田	虫	交	回	耳	外	耳	耳	耳	耳	耳	耳	
P	弗	冫	冫	肉	良	豆	豕	足	那	走	羊	辛	更	身	丞	求	采	告	夷	夷	夷	夷	夷	夷	夷	
Q	我	冫	冫	里	见	豆	豕	足	那	走	羊	辛	更	身	丞	求	采	告	夷	夷	夷	夷	夷	夷	夷	
R	良	冫	冫	余	冫	克	吕	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	
S	廛	更	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	
T	制	炊	免	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	
U	豕	重	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	
V	曷	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	
W	肅	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	
X	產	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	
Y	業	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	
Z	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	
1	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	冫	



# APPENDIX 2 STRUCTURAL ANALYSIS

故	做	是	裏	鬼
時	部	靜	然	前
樂	鄉	說	對	鄰
琴	寶	箭	協	聯
幫	有	氣	道	道
還	健	號	岸	或
國	的	教	備	原
織	導	選	感	蘭
滅	成	麼	因	府
發	會	關	應	處



# APPENDIX 3 TRANSLATION TABLE

\*\*\*\*\*  
 \* THIS TABLE CONVERTS A RADICAL CODE INTO A FIVE-DIGIT NUMBER. \*  
 \* THE FIRST TWO DIGITS REPRESENT THE GROUP NUMBER AND THE LAST \*  
 \* THREE DIGITS REPRESENT THE POSITION OF A RADICAL WITHIN THAT \*  
 \* GROUP. \*  
 \* EXAMPLE , IN THE FIRST LINE, THE FIRST FIVE-DIGIT NUMBER \*  
 \* "01008" INDICATES THAT 01 REPRESENT THE FIRST GROUP AND \*  
 \* 008 REPRESENT THE EIGHTH RADICAL WITHIN THE FIRST GROUP. \*  
 \*\*\*\*\*

01008010030100901006010020100401007010100100101011010120101301005  
 02019050360507602016020120302502018030110302606054060770200602003  
 04032020140200402020040180200103007020210201502008030040304604013  
 03047050130503803044030130201103029020220200502010040080200202009  
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 03020040290501605020050780301007032040400702005052060360304304036  
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 03033060440706105047060580703305048040310602203024070500708306071  
 05021060050401105074050010401504012060970601305049060480705407084  
 05002050330700105079060980600206099060250708107026060370607206064  
 06078060490607907039070510700206014040190404406009040330402805017  
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16003130121401812007130041400513011130181300118004150041601013002  
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06087060880608906090060910609206093060940609507067070680706907070  
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14024140251402614027140281500715008160121601316014160151601617008  
17009170101701117012170131701417015180071800819003190041900519006  
19007200022100321004230022300324002240032400425001250022700227003  
27004

# APPENDIX 4 COORDINATE TABLE

\*\*\*\*\*

\* THE FIRST THREE LINES PROVIDE INFORMATION OF GROUP NUMBER

\* AND NUMBER OF RADICALS WITHIN THAT GROUP.

\* FOR EXAMPLE , IN THE FIRST LINE 1 13 MEANS THAT THERE ARE

\* 13 RADICALS WITHIN THE FIRST GROUP.

\* IN THE FOURTH LINE, "4183218" ARE THE COORDINATES REQUIRED

\* FOR THE TEKTRONIX GRAPHICS SYSTEM OR A PRINTRONIX PLOTTER

\* TO PLOT THE RADICAL " — ".

\* IN THE 6-TH LINE, "32321618242524 4" ARE THE COORDINATES

\* REQUIRED TO PLOT THE RADICAL " 1 ".

\* NOTE , THE NUMBER OF PAIRS OF X,Y COORDINATES FOR EACH RADICAL

\* IS TWICE THE NUMBER OF RADICAL GROUPS.

\*\*\*\*\*

1	13	2	23	3	48	4	53	5	80	6	104	7	88	8	65	9	55	10	59
11	23	12	29	13	26	14	32	15	8	16	16	17	15	18	8	19	9	20	4
21	4	22	2	23	3	24	4	25	2	26	1	27	4	28	1				

41832183232 418182418 81432 826183218 4221232 42832 82818182410201630 41012 6 4

4123212 4263226 4 432 4

32321618242524 4 4183218183218 416161010201626101832 42418323224182218 8 4 832 8

6261212302624121630 6101222322218183018183018 6 43032302034 4241426222012 42214

43232 43232 4 4 4323232323232 4 8262826 41032101632 41820323212183218 418243016

4323232323218 4 4323232183218 4 432 4 4 4 432 4183218 418 414 81832 42418323224

12241212243224 4162220 8 4 832 824321218121824 4

143222241224241812 42414 41832181224121224242412 8182818183218 4 4 432 4 418 4 6

4183218321832 6 822 814183218 4181828181832 4 4183232 4 312281212281212243224 4

24 418 8 4183218 8 428 4183218 4 4223222183218 6 4 432 8 6283028182818 8 4 832 8

8343234 834 614 614 4 42832 8222826 816182018 41832 4 6 4 628 6261030 2 83012 6

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101622 41432 6201026262626261412 82814 8183218 4302822 812322432183218 4 4203220

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2930 624 624 6 6 6261024321228 4203220183218 4 42832281832 410102410 41832 4 6

4 628 6241032 2 428 4 4 4 432 4322832 4 432 416 432323232323216 432 4 4 4323232

323232 4 43230323032 410 4303210

- 97 -

1834 430 430 4 4 4303230323032 4 4 432 41432 426223232262828 4 4 82828 428 432 4  
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428322824322812281232 432 43212283232282232 616 61630 4302218101810 4 4 2223422  
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281428 4 6 428 4 624 410102810 810 826 826 8261612321824262032122828 4 426321028  
10242624 8203020183418 418 414 81820 6 6182030 6 8322832 42432241424141410 4 4  
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628 6 4 6283028302830 430 424 8163218221822241418221214 426322618321810181018 4  
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6321632 4241824 824 810 810 4 4142414 414 432 432 43210 6263026183218201820 6 4  
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1832 812 812221214242824282418 4 4 432 4111825181034 622 8283028302828 428 42418  
162812 8242820 8 8202412 6823032183218 41428 6 8101814 8302822 8261830 8 4 432 4  
4302430243024 424 432 432 43212123012161216 4 4 82216102830 626 626 620 6203020  
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824121828243216 628 6 6 6283028302830 630 62610 6183018142814 8222822 818321824  
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18301810 8102810 4 432 4 4323232 826 810 826282628262810 8182818 8102810 4 432 4  
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1234 426 8302830 8262626 4222622262226 426 432 432 43212143210282232262810282628  
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634 6 8 6 8 4 2203020241028162810261626242830282426302610241020102430243020  
1724172023242320102030201218 81410163016301630 230 228 4101210 810122612261226 8  
10 826 8181618 2 8 226 222 426 21434163022342030 4303230183014261426141414262226  
22262214142222221418221814142214 426 414 826 814 8201220 41414142226302630263020  
3020282226261426143214321432181614 410201432101410 6 414102210221010 4141028 4  
28 432 4 634 630 634163416341630 630163020342030203430343034303020303030 4263226  
1826 622 622 613 622302230223013 6193019 6163016 61330131013 4 4261330 730 732 4  
6 7 6 2 6 716 716 716 2 6 216 220 720 220 730 730 730 220 230 2  
4343234 430 418 43032303230321818341818 8261426 822142222262822222822 418 414  
418101810181014 414101415181514151821182118211415142114261826142618321832183214  
26143214 4103210181018 21410 4 2 9 614 2321022 227 632 2 4 232 2

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# APPENDIX 5 INPUT COMMANDS TO GENERATE A CHARACTER

RANK	FREQ.	INPUT COMMAND	RANK	FREQ.	INPUT COMMAND
1	26738	JK"(AO+(AB"-1)).	2	14147	AA'.
3	8916	FO&JM.	4	7461	QA'.
5	7176	AX'.	6	6894	AQ[FQ.
7	6707	CME(FV](CK!AA)).	8	6634	FX'.
9	6631	NG'.	10	4505	AN<CS.
11	5555	AW'.	12	4810	CX'.
13	4482	AP'.	14	4376	BB'.
15	4357	SH'.	16	4325	AN<SD.
17	4216	DK'.	18	4006	DM'.
19	3967	FR?PZ.	20	3905	GD'.
21	3883	NI>AR.	22	3766	AN<(CMEJP).
23	3519	JL"CK.	24	3500	KB'.
25	3385	JS;DB"GM.	26	3313	YL;CV.
27	3291	NH;CP.	28	3280	GH'.
29	3148	FO"(CY&CN).	30	3108	KD'.
31	3041	CR&(NM;FG).	32	2938	JW'.
33	2838	DI"CS.	34	2800	GN'.
35	2790	AT&GI.	36	2759	CO&QG.
37	2727	PZ"((AV;CK)!AZ).	38	2695	JX'.
39	2517	NF&KE.	40	2476	DB'.
41	2426	JR'.	42	2380	SF"CT.
43	2349	JV'.	44	1981	(AY;QD)!FZ.
45	2262	CP"CV.	46	2253	CS'.
47	2167	AN"KC.	48	2160	CZ"(DF;DA).
49	2159	CW;CW.	50	2155	DV'.
51	1573	QK[(-1;JQ).	52	2128	CV'.
53	2079	CZ"NL.	54	2049	FO'.
55	1998	DC[(VN;DF).	56	1988	JZ\$(AC>-1).
57	1945	AN"KM.	58	1972	UJ'.
59	1949	KN'.	60	1944	DD;DD.
61	1881	NH'.	62	1854	FW'.
63	1842	FP"NQ.	64	1801	HD'.
65	1800	KU'.	66	1800	UK'.
67	1791	FR?UI.	68	1722	GL[(-1&DR)"FT.
69	1720	FP"(NJ;KQ).	70	1710	VO'.
71	1698	QI'.	72	1696	DX"AS.
73	1696	KK^(DL"FY).	74	1692	CQ"GE.
75	1681	GT'.	76	1674	NY'.
77	1617	SP'.	78	1584	QJ?(-1"DS).
79	1575	GK"GB.	80	1548	NJ;CX.
81	1545	UL'.	82	1540	NU;AZ.
83	1537	BH;BE.	84	1535	SN'.
85	1518	CME(DG&(AY&NR)).	86	1513	NK'.
87	1509	AY&DH.	88	1505	CL"JV.
89	1500	JL"UF.	90	1483	KA;AVIFS"CN.
91	1475	JN;CK"CT.	92	1475	BG@GA.
93	1457	BQ'.	94	1455	UF"AU.
95	1447	UH'.	96	1249	AN<AP.

97	1412	FQ'.	98	1409	UH'.
99	1407	AN"JP>FT.	100	1398	BR'.
101	1389	FO" FQ.	102	1389	CL"(AT&JY).
103	1381	SQ'.	104	1377	VQ'.
105	1369	BP'.	106	1346	DZ'.
107	1335	DD'.	108	1332	CL"FY.
109	1330	FO&SM.	110	1312	NE"((AA&DU)IDE).
111	1310	PZ"(JO;FP).	112	1303	GX'.
113	1298	FW"(BC;BF).	114	1297	SD^GQ.
115	1293	BA'.	116	1277	NZ"(AA&DH).
117	1263	GL[AS.	118	1234	NF;CY!CN.
119	1228	DA;CK.	120	1208	CP"CK.
121	1205	CO&JM.	122	1187	CW>BS.
123	1183	HE"GPIGG.	124	1173	AU"CM.
125	1165	DE'.	126	1156	KV'.
127	1154	FR?((JU;GA)!FZ).	128	1134	GY"HF.
129	1131	SJ;KZ.	130	1121	AH&FS.
131	1114	CL"DE.	132	1113	HJ]NN.
133	1113	WS'.	134	1111	JN;FP"GB.
135	1097	SL'.	136	1097	SI;DH.
137	1097	KA;AV;OG.	138	1096	CM&CX.
139	1091	GO"AS;BB.	140	1090	DW"(BV&KF).
141	1082	CW;CK.	142	1075	FU'.
143	1074	AU'.	144	1073	FR?SE.
145	1065	DJ&(FQ"AR).	146	1064	CZ"((FO;AA);CN).
147	1048	HO'.	148	1043	CP"UG.
149	1033	QH"(DA;CK).	150	1031	BD&QC.
151	1025	SD^CK.	152	1021	JN'.
153	1021	FP"(VP](AW"-1)).	154	1016	AN"OL.
155	1015	FR?(DJ&NK).	156	1015	OA'.
157	1006	SI;JO.	158	1005	HU'.
159	1004	CL"JR.	160	991	XQ"(BM!CK).
161	994	ZI'.	162	993	KL"FT.
163	984	NR'.	164	980	QF"UE.
165	964	LA'.	166	952	GS&OF.
167	940	FS"QE.	168	938	CK"BU.
169	938	CK<(AT&AG).	170	935	BC&FS.
171	933	AT&JY.	172	931	CR;CK.
173	931	BF"GR.	174	929	JO;FP.
175	928	AN<KR.	176	926	CR;AD.
177	923	YU'.	178	921	VR"(NW;QF).
179	913	NP!FO.	180	910	AA&JK.
181	897	QC'.	182	896	GZ&FZ.
183	892	DS'.	184	891	SS"HK.
185	889	KC!FU.	186	880	NV'.
187	873	CZ"((FO;AA);CN).	188	870	AN"JN.
189	861	OP'.	190	855	GW'.
191	854	VP](AW"-1).	192	853	FP"JQ!FU.
193	845	KL'.	194	841	CO&CV.
195	840	JN;FO!FU.	196	839	HC;FQ.
197	830	BN[(JK;DB).	198	826	DI"CS.
199	824	KG&DE.	200	813	NE"((HP&CW)!FU).
201	805	HA;JQ.	202	802	FR?(BL&JX).
203	802	CL<(DT;CK).	204	799	DJ&KA.

205 799 CO&AS.  
 207 787 FS<QD.  
 209 782 AN<QM.  
 211 778 HQ'.  
 213 769 HB"(GJ&CN).  
 215 760 CO;JY!QB.  
 217 758 QW'.  
 219 754 NE"(CR;CK).  
 221 754 WY+(-1;NT).  
 223 753 AN<((BO;HS);NX).  
 225 744 SK"FQ.  
 227 744 SL'.  
 229 738 UR?(-1"UE).  
 231 734 DW"(FT;FP).  
 233 731 DN"(GC;FQ).  
 235 724 GF'.  
 237 713 FS"QP.  
 239 705 GV'.  
 241 702 HZ'.  
 243 693 SK'.  
 245 677 SD^FO.  
 247 647 SD^((DF"DF);LB).  
 249 670 QN'.  
 251 662 JK'.  
 253 656 CQ"BT.  
 255 654 CT"(CO&GV).  
 257 652 FS'.  
 259 644 CK&AU"AR.  
 261 638 JN;FP"QE.  
 263 637 OC;JK.  
 265 635 JO;IA.  
 267 625 OR](-1;FS)"XS.  
 269 622 KF"CK.  
 271 619 SG'.  
 273 613 EB?NP.  
 275 607 HI;GE.  
 277 605 LP'.  
 279 602 XA'.  
 281 599 DG<(DP[AS).  
 283 591 NE"((AY;BE)!AZ).  
 285 580 FW"FT.  
 287 576 JY'.  
 289 575 CL"(GC;FQ).  
 291 573 HM'.  
 293 567 AN"(AE+CY).  
 295 563 SZIGG.  
 297 558 AQ[DH.  
 299 556 CT<UM.  
 301 552 XC'.  
 303 546 FP"UQ>CN.  
 305 544 JT"CY.  
 307 543 DY'.  
 309 538 CO&GV.  
 311 536 DL"SL.

206 796 QE'.  
 208 784 FV](CK!AA).  
 210 780 CK&QB.  
 212 775 DC[(GS;BA).  
 214 760 UF'.  
 216 760 AA&KS:  
 218 754 KT"KP.  
 220 754 CK'.  
 222 753 JL"AR.  
 224 747 OQ'.  
 226 744 FO&JW.  
 228 740 SR'.  
 230 735 US'.  
 232 734 DN"HN.  
 234 731 OE'.  
 236 720 HR'.  
 238 709 AQ;JQ!CX.  
 240 704 QH"NL.  
 242 698 CO&CP.  
 244 538 QI'.  
 246 675 CU&(AN"AS).  
 248 671 EF'.  
 250 666 SG<(OO](DG;FS)).  
 252 660 GQ"DQ.  
 254 655 PZ"(DT;CK).  
 256 652 HI'.  
 258 650 XR'.  
 260 642 FR?((NK;KG)!FW).  
 262 637 AN<EL.  
 264 635 FR?(GK[KJ).  
 266 626 AF+HG.  
 268 623 UT'.  
 270 618 ((CK;BZ)"(NS[BI)).  
 272 617 CU&LE.  
 274 609 SD'.  
 276 607 WV;(BC&GW).  
 278 602 AN<AS.  
 280 601 WT!AP>GU.  
 282 598 UG'.  
 284 589 FR?(BD&QC).  
 286 578 CZ<XS.  
 288 576 DC[XR.  
 290 574 PZ"(NJ;QA).  
 292 570 AT&AP.  
 294 563 CQ"(JN;CP).  
 296 560 FR?((DO;AV);GZ).  
 298 557 NN;GP"UE.  
 300 554 OH;FUIDA.  
 302 547 CP'.  
 304 545 SK"GB.  
 306 537 YV'.  
 308 538 UU"(AA&NE).  
 310 536 PZ"(GC;FQ).  
 312 536 AN<QA.

313	532	JN;FO.
315	529	CU&JO;LR.
317	525	NE"HM.
319	521	CA'.
321	506	CL<(1C;DL).
323	514	DC[(AN<CN).
325	513	*DC[((AN<SE);FU).
327	504	FP"JQ.
329	499	NE"KO.
331	498	OU;BC^DQ.
333	495	AN<KW.
335	494	DE<AU.
337	491	OW'.
339	490	BO&GE.
341	488	JL"HT.
343	487	FR?QC.
345	486	AA&QY.
347	483	PZ"(CR;KJ).
349	480	QM'.
351	480	OH;BA.
353	478	CL<(HC;EJ).
355	474	SU'.
357	470	NE"(AO+(AB"-1)).
359	466	ZU"QE.
361	463	CL"(BE;CK).
363	461	CL"HN.
365	460	DT'.
367	457	DR"OD.
369	457	KI'.
371	454	AN<(SO!CN).
373	452	CQ"(AS;FO).
375	450	CT"FW.
377	450	LS"(FT;AU).
379	448	NT"((DF"DF);LB).
381	445	EC"HE;FS.
383	443	FP'.
385	442	XT'.
387	440	NN"HT.
389	436	JN&QD.
391	434	PZ"((CY;JU)IQB).
393	433	PZ"CN.
395	424	JL"CK.
397	421	BU"FT.
399	419	CU&(WU"JL).
401	418	CO&QU.
403	416	OV'.
405	414	FR?(DJ&NK)!CN.
407	411	JP'.
409	409	CQ"(FO&JM).
411	403	AN<(CK;FP).
413	402	LL'.
415	401	UO'.
417	400	GO&EV.
419	396	QD'.

314	530	GO"AS.
316	526	1C;DA.
318	524	KY[LO.
320	518	NPION.
322	515	PZ"(AT&AP).
324	513	CV'.
326	505	ET"BK.
328	499	GY"(CY&CN).
330	499	NJ;QA.
332	495	QL"AU>QL.
334	495	NS[(-1&(EK?BI)).
336	493	AQ[BA.
338	491	FR?QR.
340	489	AV&KE.
342	488	SE;FP.
344	487	FR?GB.
346	485	PZ"(GN;CK):
348	481	JQ'.
350	480	UN'.
352	479	NF&(LU"BK).
354	465	DL"(CK&NO).
356	471	PZ"(KX;KS).
358	468	NQ'.
360	464	HA'.
362	462	CY'.
364	461	FR?((DO;DG)!FZ).
366	459	FQ"HK.
368	423	NE"(JK;GT).
370	456	FO;AP.
372	453	FS"CB>FS.
374	452	PZ"FY.
376	450	SF'.
378	449	AN"pz.
380	447	RB[(-1;DD).
382	444	(CR;CK);GW.
384	442	PZ"OD.
386	441	QR'.
388	437	GE'.
390	436	ST"EE!GG.
392	433	AN<(LW[(-1&JX)).
394	433	OI;GPIOI.
396	424	JQ"NL.
398	420	BG@EA;CK).
400	418	XB"FT.
402	416	VS'.
404	415	NE"(CY!CK).
406	414	CQ"JN.
408	410	FO"(BJ;CK)!GG.
410	408	PZ"AP.
412	403	FR?((EI"EI);NV).
414	402	FQ"FQ.
416	401	SW'.
418	396	SV"HL.
420	396	CL<NT.

421	396	NJ&UN.	422	395	DO'.
423	395	KR&QD.	424	393	NE"UP.
425	393	KO'.	426	393	CZ<KW.
427	392	CT"(DJ&NX).	428	391	ZU"GR.
429	390	NF&NP.	430	390	ST.
431	387	CR&(DG"BK).	432	387	QB'.
433	386	JR;JR.	434	386	KG&BP.
435	386	FR?(AV;GH).	436	385	DY"FT.
437	384	JP"FT.	438	376	GL[(-1&CD).
439	383	KI"GQ.	440	382	XV'.
441	382	FO<TC.	442	381	NI'.
443	380	XQ'.	444	380	CT<(CR&FP).
445	376	CL"JP>FQ.	446	376	QN"CN.
447	375	CL<KW.	448	375	UX;JT.
449	375	FR?(LM;QB).	450	374	DI<UM.
451	373	NW;QV.	452	373	NE!CO;LF.
453	220	CZ"VX>EG.	454	372	CL<(GS&RH).
455	372	NF&II.	456	371	CL<OK.
457	370	FS"GV.	458	369	RF'.
459	368	LV!BH.	460	366	HL'.
461	366	CR;BL"UE.	462	258	JV"BK.
463	364	FR?(FW"(AT&CV)).	464	361	DC[(KK&(DL"FY)).
465	361	WW;FP.	466	361	JT"LT.
467	359	DI"(JZ\$(AC>-1)).	468	358	WV!BH.
469	358	DG<(FO;IB).	470	358	JL"(GJ&KS).
471	357	NE<(SX]FO).	472	355	NE"(GK[KJ).
473	355	FP<ZU.	474	355	HH&RE.
475	353	CL<(EO&FQ).	476	352	LN'.
477	352	HH!BD;DH.	478	350	CT"JR.
479	349	PZ"(EQ;FU).	480	348	NF!JQ!CU.
481	346	KP'.	482	346	DN"JW.
483	344	LG'.	484	342	CO;GC!CK.
485	342	FP<TG.	486	342	SM'.
487	342	CL<KV.	488	341	GC;FQ.
489	340	QH"LD.	490	340	NH;JT.
491	339	CL<(PC^BW).	492	338	CL<WX.
493	337	KO"AU.	494	336	QP'.
495	332	TA>.	496	331	KT"BJ.
497	330	SK!DO.	498	330	FO;JS!DB"DQ.
499	329	DG<(CR;CK).	500	328	HW"AR.
501	326	CP"LK.	502	326	HG'.
503	326	CP"(BE;CK).	504	326	PZ"(EN]DE).
505	318	YN!AA!BH.	506	322	QC"(CR;KJ).
507	322	DE"UE.	508	321	DG<UG.
509	321	AC"NQ.	510	320	SF"CT.
511	319	JU&(NE"SE).	512	319	YL;QE.
513	317	LI^FO.	514	317	(CO&KX);(BC&QB).
515	316	TH'.	516	315	NF&(CR;CK).
517	315	PZ"DY.	518	314	JL;CP.
519	312	FP"NL.	520	179	CW;CW"LC.
521	310	AN<(AF+EA).	522	309	EZ'.
523	308	CQ<(NS[(-1&QG)).	524	308	CME(SO!CN).
525	307	SG"(GU;GU).	526	307	TA;OB.
527	306	NN"(GC;FQ).	528	305	JT'.

529	304	JT"(GA;JO).	530	304	CT<SN.
531	303	QC"(SO!CN).	532	303	SJ'.
533	302	JS;DB.	534	301	CL<(FO;KH).
535	300	JO'.	536	298	1D'.
537	298	RA'.	538	297	VV"SE..
539	297	PZ"FA.	540	296	CK"GE.
541	293	CU;FO!AP.	542	293	JR;JR"GR.
543	293	VW'.	544	293	SJ;HC.
545	292	HB"CY;OB.	546	291	QX"(BJ&GI).
547	291	SO!CN.	548	291	(CK&NO)"SE.
549	290	CO&NI.	550	288	JU;QB.
551	287	JZ\$GA!FU.	552	286	CU&(SD^UP).
553	286	JS!BD!AZ.	554	285	LD'.
555	285	YN!AA!BH.	556	284	CO&LF.
557	284	ST"EE;AU.	558	284	QJ?(-1<MB).
559	281	NN'.	560	281	GK[FW'.
561	281	BX&(AQ(DH).	562	281	NS[(-1&(EK?BI)).
563	280	OJ"(BI;CM).	564	280	AC]GA.
565	280	FO&HF.	566	279	HI;CW!CW.
567	278	CU&JP.	568	278	PZ"(AC]GA).
569	278	DC[((AN<SE);FU).	570	277	WX"SE.
571	277	CT<(OS^JT).	572	275	CK<LH.
573	274	IH'.	574	274	CU;GJ!FP.
575	273	FP;CV.	576	273	EU"(JK;AS)>CT.
577	273	DP[(CU;IK).	578	255	CR;AD!FU.
579	272	HG"QE.	580	272	JL"(CK;FS).
581	271	PZ"(GF;GF).	582	271	ZM'.
583	271	TD'.	584	271	NE"JO.
585	271	NT<(SX]FO).	586	271	JN"(BM;CK).
587	270	IM'.	588	268	CQ"(AY&BI).
589	266	AA&NK!DA.	590	265	CQ<(CY&CN).
591	262	CT"(AN<CN).	592	261	QC"((AA&DU)!DE).
593	261	QZ"FT!KL.	594	261	AQ[DE.
595	260	CZ<UW.	596	260	RC'.
597	259	JZ\$(AC>-1)IKH.	598	258	CZ"ZX>EG.
599	257	BO&HS;NX.	600	256	LQ'.
601	255	CQ<SE.	602	255	DP[AS.
603	255	WZ'.	604	255	NE"DE.
605	253	JT"(NW;QF).	606	253	CQ<GU.
607	253	AV&NM!FO.	608	253	WU'.
609	252	AN<JR.	610	251	JT"KO.
611	250	PD'.	612	250	CU;HR!FP.
613	249	GJ&IE.	614	248	CL<HA.
615	247	PZ"ZV.	616	246	WT!AP.
617	246	BY&KF"FY!QS.	618	245	DJ&NK.
619	245	SO;FU.	620	244	DN"EC.
621	244	DG"CQ>JN.	622	244	NK;FU.
623	243	CL"SE;AP.	624	243	CK"CT>JR.
625	243	LE'.	626	242	DQ"UE.
627	242	PZ"SE.	628	244	SY"fq.
629	241	FO"KC.	630	241	CO;CP!FP.
631	239	DC[(ID;LJ).	632	239	PZ<(SX]FO).
633	238	CL<OE.	634	238	PF'.
635	237	PA;QB.	636	237	BE;CK.

637	237	QX'.
639	237	CL<((BD;BH)&FP).
641	165	GJ;DF!CX"SE.
643	235	CU&(BC&FP).
645	235	CL<XE.
647	233	NS[QF>GU.
649	231	AN<((JS!BD)!BT).
651	216	HY[(-1&CK);OK.
653	228	DN"JK.
655	228	CK;IJ.
657	227	AN<(EB?NP).
659	226	DN"((FO;JU)!BA).
661	226	AN<GX.
663	225	QO"(AT&XD)!KH.
665	220	NO;(NO"NO).
667	223	CZ<NP.
669	223	NE"((CY;JU)!QB).
671	222	OJ"(AY&BI).
673	221	BY@SU.
675	221	CL<HJ.
677	219	GF<(OS&QF).
679	219	CP"KO.
681	218	CU&(CL<(DA;CK)).
683	217	CQ<(QQ;JO).
685	217	YO'.
687	216	DC[(EB?(AE+CY)).
689	216	BX&FP"FY.
691	215	MH'.
693	213	GX'.
695	213	DE<FT.
697	212	LN"HL.
699	212	CO&JT.
701	210	CL<(CC[FZ).
703	210	JQ<UZ.
705	210	WW;FP.
707	209	GO'.
709	208	CP"BA;AU.
711	208	AQ[BE"SE.
713	207	LY&NO.
715	206	AF+ER.
717	205	NO<(DA;GZ).
719	205	KG&LH.
721	204	CU;WW!FP.
723	203	NP;ON>AR.
725	203	IP'.
727	202	QP"FT.
729	160	FQ"JV>BK.
731	200	QJ?(FO;EH).
733	200	SJ;OA.
735	199	FR?(HH&(BG@JP)).
737	198	FP<(JK;DH).
739	198	IG;AZ.
741	197	JU&SW.
743	197	AN<OB.

638	237	CU&SF.
640	236	CL<JV.
642	235	DI"BJ.
644	235	FP;KR.
646	234	PZ"(BG@EA;CK)).
648	232	NE"HV.
650	231	CR;BL.
652	229	CL"QC>GB.
654	228	KI"KP.
656	228	CM@((DO;DG)!FZ).
658	227	DI"(AV&(NM!FO)).
660	226	CO;LG!DD.
662	226	SG"(JN;QD).
664	225	TF'.
666	222	FP"CN.
668	223	YW'.
670	222	QH"OX.
672	222	DP[(AC]CK).
674	221	DP[JP.
676	221	NE"NE.
678	220	UV'.
680	218	LZ&SG>AR.
682	218	NE"DY.
684	217	DI<VU.
686	216	NF&(QC"BW).
688	216	DW<(DA;DQ).
690	216	IC"UE.
692	214	NE<YX.
694	213	PZ"BT.
696	194	EU"PE>CT;VD.
698	212	ES'.
700	211	FP"HL.
702	183	SV"(CO&LF).
704	210	GC&NE.
706	209	FR?(CR&FP).
708	208	JO&OF.
710	208	BF<(CR;(-1<BL)).
712	205	PZ<(OS&QF).
714	206	CQ<FY.
716	205	CO;(FS"OT)!QB.
718	205	HB"(GJ&CN)!CX.
720	205	JT"QE.
722	203	PZ"(CU&VS).
724	203	GB"GB&QB.
726	202	((OM"CN);(JK;DH)).
728	202	CY;FU.
730	201	CX&JR.
732	200	DI<ZN.
734	199	AN<(CR;KJ).
736	198	CQ<SU.
738	198	OD>AR.
740	197	FP"(DA;CK).
742	197	DK;DB"BA.
744	197	JZ\$(AA&CP).



745	196	JL;FO.	746	196	UF'.
747	196	CT<(FR?(ME;FQ))\.	748	195	XY"CT.
749	195	UG"YM.	750	194	DC[(OR]FS)"XS).
751	194	AN"HW>AR.	752	194	WU!FO.
753	194	CL<QS.	754	194	AN<(AT&UM).
755	194	FP"EF.	756	193	SG"((JN;FO)!AZ).
757	193	AF&JU&NX.	758	193	QB"AR.
759	193	PZ"MG.	760	192	ED"LC.
761	192	SY"(AT&AG).	762	192	EN]DE.
763	191	JL"UF.	764	190	JN"(DD&OA).
765	178	NF&(SD^FO).	766	190	CO&BB.
767	190	DP[NI..	768	190	MK'.
769	189	NE"SE.	770	188	OJ"FY.
771	188	BG@DJ;DD>AR.	772	188	FW"(AT&CS).
773	187	CO&(GA;JO).	774	185	YY'.
775	186	TB!BD!AU.	776	186	ZJ'.
777	186	GC;QB.	778	185	FQ<YM.
779	185	NF&(DJ&(FQ"AR)).	780	185	KQ'.
781	184	TC'.	782	184	IN"UE.
783	184	MA'.	784	184	JN;FO!AP.
785	183	((GC;FQ)"(GJ&IE)).	786	182	DG<HM.
787	182	BN[(JK;DB)"UE.	788	181	GF"XU.
789	181	SG"(HX;FO).	790	181	FO<(JN;FO).
791	180	TB!BD;RG.	792	180	CM@VT.
793	179	JL;CV.	794	178	XZ>AI.
795	178	MI'.	796	178	DD&(BN[EH).
797	178	DL>AJ.	798	178	CZ"PI>FT.
799	176	AN<(HV!AA).	800	176	FB"BJ;JO.
801	176	NE"(EX&LJ).	802	176	JQ<(GC;FQ).
803	176	AN<EM.	804	175	LM;QB.
805	175	AN<(NH;QB).	806	175	1I'.
807	174	CL<KP.	808	174	FO;JS!DB.
809	174	FW"(AT&KF).	810	174	ML'.
811	174	DI<(EN](CK!AA)).	812	173	(JK;AS)"BK.
813	173	CU;SE!NU.	814	173	QD"IC.
815	172	HG"HG!FO.	816	172	TI"FT.
817	170	DC[SR.	818	170	FQ"GE.
819	170	FR?NL.	820	169	DC[(HV!AA).
821	169	DN"(BA;DO).	822	169	QQ"BA;NE.
823	169	AP<(AU;(AU"AU)).	824	168	DJ&KA;FO.
825	168	AN<NV.	826	168	JL"GF.
827	168	CQ"QQ.	828	168	AQ[CK.
829	167	CK<MD.	830	167	BO;FD!FU.
831	166	LC'.	832	165	FP<(NH;JT)).
833	165	HF;FU.	834	165	AA&NE.
835	165	FP"IF.	836	165	LH'.
837	164	NE"(GC;QB).	838	164	NI"FT.
839	163	CL<YW.	840	163	NJICU!CK.
841	163	AN<KB.	842	162	KT"QT.
843	162	OY;BC!CW.	844	162	GA;JO>AR.
845	162	FS<((JU;GA)IFZ).	846	162	PZ'.
847	161	GC;JY.	848	161	CP"IR.
849	161	NW'.	850	161	DC[(GS;DH).
851	160	QB"FT.	852	159	DG<((GO"AS)&QX).

853 158 DI<((JN;FO)IAZ).  
 855 157 NN"(DC[(ID;CM)):  
 857 157 QO"(AT&UO).  
 859 156 JN;FOIAZ.  
 861 156 OI&BN[(TI"FT)).  
 863 155 SJ;FC.  
 865 155 FR?(BG@(EA;CK)).  
 867 154 HH;BD&FW.  
 869 153 SG"(AS&TD).  
 871 152 YX>GB.  
 873 152 HB"GP.  
 875 151 DL<(WT!AP).  
 877 151 AN<(AA&NE).  
 879 151 VY&(FO;(NO"NO)).  
 881 150 CO&(GC;JU)IFU.  
 883 148 AN<JK.  
 885 148 DA!BF.  
 887 148 FP<SW.  
 889 147 CY;JUIQB.  
 891 147 SJ;JO.  
 893 146 PZ"FW.  
 895 146 FQ<(OZ^AU).  
 897 145 TM'.  
 899 145 TL'.  
 901 144 VR'.  
 903 143 SI;XQ.  
 905 143 ES"UE.  
 907 143 FR?(FB"BK).  
 909 142 CU&LC"FT.  
 911 142 BM;FO!FP.  
 913 141 HW"AR!GG.  
 915 141 SG"AP.  
 917 141 FR?LX.  
 919 140 CK<VA.  
 921 92 FR?NH.  
 923 139 IF'.  
 925 138 FP<(LI^EA).  
 927 137 CZ<(CY&CN).  
 929 137 JK;FS.  
 931 137 CO&CN.  
 933 133 AP<(QT!CN).  
 935 136 NQ"FT.  
 937 135 CU&WC.  
 939 135 SS'.  
 941 134 AN<RP.  
 943 134 JL"BE.  
 945 133 OM"CN.  
 947 132 CL<(JZ\$(AA;GF)).  
 949 132 KI<WD.  
 951 132 QQ"DQ.  
 953 129 XH;QF.  
 955 131 NE"HZ.  
 957 131 CT<YM.  
 959 130 ED<(JU&(AO)NO)).

854 157 CQ<((BM;FO)!AP).  
 856 157 CO&XW.  
 858 156 GK'.  
 860 156 BY@UO"GR.  
 862 155 CZ"OM>EG.  
 864 155 PZ"ES.  
 866 155 CQ<TE.  
 868 153 FW"(AT&SK).  
 870 153 LK'.  
 872 152 SG"(BI;CK).  
 874 152 NE"(DA!BF).  
 876 151 FP<(KX;KS).  
 878 151 FO&QV.  
 880 150 KY![(BL&JX).  
 882 149 DG<LK.  
 884 148 KF<QF.  
 886 148 SO"FY;GW.  
 888 148 TB!BD;FP.  
 890 147 CQ<(HV!AA).  
 892 147 CL<TF.  
 894 146 AN<FP.  
 896 145 AN<VB.  
 898 141 SE"SE;BA.  
 900 145 CL<(BI;CK).  
 902 144 PZ"QN>CN.  
 904 143 QJ?(-1<SM).  
 906 143 CQ<(GJ&OT).  
 908 142 FQ<(DU&(HP@BX)).  
 910 142 CT"NL.  
 912 141 HH&(BG@JP)>FT.  
 914 141 MN!GG!KH.  
 916 141 CR;(HY[DG]>AR.  
 918 141 JL"(CW;CW).  
 920 140 BF<GR&QB.  
 922 139 CO&(DA;CK).  
 924 139 GF<((HE"GP)!GG).  
 926 92 QG"SF.  
 928 137 KI<(DG[XR).  
 930 137 BM;CK.  
 932 137 RL'.  
 934 136 BN[(VN;GO).  
 936 136 CO&PB.  
 938 135 JO;AU.  
 940 134 NE"(BO&GE).  
 942 134 CL<BP;FP.  
 944 134 YZ!DO.  
 946 133 OK'.  
 948 132 BO&QB.  
 950 132 CQ"(BJ;CK).  
 952 132 HH&(BN[DQ]"UE.  
 954 131 VO!FU.  
 956 131 FP<OD.  
 958 130 NF&(CL<(QT!CN)).  
 960 130 QR;SU.

961	190	JL"(GC;QB).	962	130	CU&(CMEJL).
963	130	SG"NL.	964	129	AN"NI>AR.
965	129	LI^LJ.	966	128	JP"FQ.
967	127	VE'.	968	127	KG&GP.
969	127	DC[(SI"FT).	970	127	CME(CK&QB).
971	121	SY"(CR&AP).	972	126	ZB"UE.
973	126	AN<BB.	974	126	BL&JX!AU.
975	125	DX"AS;FQ.	976	125	NZIGO"TE.
977	80	GK"FT;CK.	978	125	SZ;(CW"GI).
979	124	CQ<JK.	980	124	JL"(GJ&NU).
981	122	CQ"OM>BS.	982	124	CL<((GZ"BJ);NE).
983	124	AN<((TK;FU)IDA).	984	123	FS"KP.
985	123	FQ<LD.	986	123	AN<(AQ[DH).
987	123	NF&(GK[KJ).	988	103	FR?KV..
989	123	BT"UE.	990	123	AN<UY.
991	123	CR;AD!CK.	992	123	QL'.
993	123	HA'.	994	123	NT'.
995	123	WB'.	996	122	CQ<QV.
997	122	FO;IB.	998	122	DR<(AA&NE).
999	121	NN"GX.	1000	121	FP;(FP"FP).
1001	120	AN<KM!FU.	1002	120	FR?XW.
1003	120	AX'.	1004	120	DN<(MO;QB).
1005	120	CY!CK.	1006	120	AN<XX.
1007	120	DG"GR.	1008	120	FR?UI.
1009	119	OJ"FYIKH.	1010	119	AQ[GF.
1011	119	CQ<(PL!CX).	1012	119	DC[RC.
1013	119	DJ;(DF"DF)IFU.	1014	119	CQ<(UO;FP).
1015	118	FP"((CU;FO)!CX).	1016	118	NN;(CW"GI)"CT.
1017	118	SG"(BG@DJ;DD)).	1018	118	CO&(KX;(BC^BF)).
1019	118	CL<NP.	1020	118	JL;EM.
1021	118	CT"QC.	1022	118	NF;(DE"EW)!FP.
1023	118	FP"(BQ;BE).	1024	118	CQ<(CO&CP).
1025	117	CU&(HB"(GJ&CN)).	1026	116	IU+(-1"GE).
1027	116	CL<(DP[AS).	1028	116	CT<(DA&(AA&JW)).
1029	116	FP"YM.	1030	116	PN"((AA&ON);ON).
1031	116	CL<(GJ&IE).	1032	116	AE&KH.
1033	116	JS;DR"EE!GG.	1034	115	FW"(AT&FZ).
1035	115	SY"VT.	1036	115	NU;RJ.
1037	115	CL<(BN[(JK;DB)).	1038	114	IV'.
1039	106	JO"(DA;CK).	1040	114	GO&FQ.
1041	114	(QO"BA)IDO.	1042	114	AN<HY.
1043	114	GM'.	1044	113	JK"(AO+(AB"-1)).
1045	113	IW'.	1046	113	CL<VR.
1047	113	FS"PH.	1048	113	CL"QB>AR.
1049	113	NH;CP.	1050	110	FP"FX.
1051	112	CL<(BG@GA).	1052	112	FP<XX.
1053	112	(FS"FS);(CR;AD).	1054	112	GD;FU.
1055	112	DP[(AV&NM)!FO).	1056	112	FR?QZ.
1057	112	AN<VT.	1058	111	GF"(LQ;FP).
1059	102	CQ<(IL[(BH&PZ)).	1060	111	DR"AI.
1061	111	CK<(JZ\$GA).	1062	111	AN<LT.
1063	110	CQ<LD.	1064	110	FR?OX.
1065	110	SG"(EX;LJ).	1066	110	AG'.
1067	109	NF&(AN<CN).	1068	109	CL<(DC[(GS;BA)).

1069	109	OI;GP.	1070	109	(DE"EW);FU.
1071	109	CL<(JZ\$GA).	1072	108	BJ'.
1073	108	FP"(JK;AS)>MF.	1074	108	GK[SE"UE.
1075	108	FP"OM.	1076	108	CQ"(DT;CK).
1077	106	FP"(CR&(HY[DG)).	1078	108	DJ&(BC&KH).
1079	108	IL[(-1&BW).	1080	79	JT"LG.
1081	107	CO;LG;NO.	1082	107	EW'.
1083	107	CR&(NM;FO).	1084	107	CO&(CX&JR).
1085	107	CQ"(GJ&(EH[BA)).	1086	106	FO&(HX&RD).
1087	106	QF'.	1088	106	CU;LC"FT;PZ.
1089	106	GO"AS;FP.	1090	106	KI<(DJ&(DF"DF)).
1091	106	UZ"CT.	1092	105	SJ;(CR;BL).
1093	105	CMEJP.	1094	105	CO&RG.
1095	57	DC[FP.	1096	105	JO&NV.
1097	104	QS"DY.	1098	104	SI!DO.
1099	103	FP"XB.	1100	104	PZ"SF.
1101	103	FX;CK.	1102	103	SG"(BG@GA).
1103	103	AN<YB.	1104	103	AY;IO!FP"SE.
1105	103	FH[CV.	1106	102	FP"JK.
1107	75	BF<GT.	1108	102	NN"GX.
1109	102	CL<IT;FP.	1110	102	DK;BS.
1111	102	ED"(CU&VS).	1112	102	KY[KF.
1113	102	SR;JT.	1114	102	CU&PO!GG.
1115	102	DP[DH>AR.	1116	101	AN<SW.
1117	101	UG"KW.	1118	101	1A'.
1119	101	QB"EF.	1120	101	PZ"(JU&SS).
1121	100	PZ"(BG@DO;CM)).	1122	100	UQ"IF.
1123	100	NY'.	1124	100	FQ"BI.
1125	100	QC"UY.	1126	100	((CL"FW)>(AT&CV)).
1127	99	OO](JO&NV).	1128	99	CMEFP.
1129	99	CL<NV.	1130	99	AU"DG;FP.
1131	99	(CO&KX);(BC&DO).	1132	99	DF"AU.
1133	99	EC;FU.	1134	98	AT&JY"FT;NE.
1135	98	FR?NZ.	1136	98	KG&(HP@CW).
1137	98	NE"XU.	1138	97	VH'.
1139	97	ZA'.	1140	56	VZ'.
1141	97	DC[(BM;CK).	1142	97	CT<(AO]OT).
1143	97	VZ^(AY&DH).	1144	97	MD'.
1145	97	OJ"((QO"EY);KH).	1146	97	AN<XF.
1147	65	GF"(NH;DO).	1148	97	CT"((CR;AD)&HC).
1149	96	AN"NI>AR.	1150	96	FS"VV.
1151	96	CU&(AN<JR).	1152	96	CU;LC"FT;UG.
1153	69	QK[(-1;JQ).	1154	96	(NT"CK);(AE+CY).
1155	96	HX&FQ"FT.	1156	96	CQ<UM.
1157	95	DC[(ID;CK).	1158	95	DC{IC.
1159	95	CK;AZ.	1160	95	CZ"UF>EG.
1161	95	CU&(ST"EE)!HC.	1162	94	GF<(FO&(HX&RD)).
1163	94	FQ<(CC[FZ).	1164	94	KT"UW.
1165	94	DN"NL.	1166	94	FQ"(OC;(BC^DQ)).
1167	94	CO&(DA;CK)"UE.	1168	94	SV"(CR&FP).
1169	93	AN<PA.	1170	93	FO"(GJ&(EH[BA)).
1171	93	NN<(KR&QD).	1172	93	FP<XR.
1173	93	AN<DD.	1174	93	FP"JQ.
1175	93	JL;CP"VU.	1176	92	CL<KP;CP.

1177	92	TP'.	1178	92	CL<(JS;DB).
1179	92	PM'.	1180	92	(JK;AS)"MF.
1181	92	CL<CS.	1182	91	JU&VO.
1183	91	FR?((DP[CK)"QL).	1184	91	DC[(SR;GW).
1185	91	CV;KH.	1186	91	DC[QC.
1187	91	DN<ZN.	1188	91	AN<(HX;FO).
1189	90	RN"(CU&JO).	1190	90	QC"QT.
1191	90	CZ"(KR;CN).	1192	90	CZ"(DD;KW)>FT.
1193	90	DP[IH.	1194	89	CL<(GF;GF).
1195	89	QO"TN;QE.	1196	89	CQ"IF.
1197	89	QH"MC.	1198	89	CQ"(CK;IJ).
1199	88	XQ!DO.	1200	88	CP"TE.
1201	88	DL<(WT!AP).	1202	88	CL"RA.
1203	88	JT"(HV!AA).	1204	88	CL"CQ>GB.
1205	88	SR;LY.	1206	88	CQ<(UX;JT).
1207	88	FP<UM.	1208	88	EC'.
1209	49	BF<(CK;AZ).	1210	87	NS[(-1;BI).
1211	87	ZE'.	1212	87	CT"(DA;GI).
1213	87	NS[(-1&QG)>AR.	1214	87	GQ"AR!DO.
1215	87	AN<(BM;CK).	1216	87	EQ!FU.
1217	87	DU;GF.	1218	87	CO&FP.
1219	87	MJ'.	1220	86	JU&UG.
1221	86	FR?(JL;EM).	1222	86	CQ"(BD&QC).
1223	86	CL"(JK;FW)>FT.	1224	51	QH"((AH;AA)&IQ).
1225	86	GL[(-1&DR)"FT.	1226	86	MC'.
1227	86	SG"(FO;HF).	1228	86	JT"(CK;AZ).
1229	85	(CU!FO);(EP&DH).	1230	85	CL<((GJ;DF)!CX).
1231	85	CU&(DC[(GS;GG)).	1232	85	ZK'.
1233	85	QJ?(-1<(BJ;CK)).	1234	85	QZ'.
1235	85	JL"((AV;CM)!AZ).	1236	85	WE'.
1237	85	FP"(CX&JR).	1238	84	DI<(CU&(CR;CK)).
1239	84	GF"KC.	1240	84	1A'.
1241	84	NE"(GJ&CP).	1242	84	SD^NT.
1243	83	GX;KH.	1244	83	EP&SE!JO.
1245	83	DI"(AO]BF).	1246	83	DD"(OY!BC).
1247	83	QC"GB!FO.	1248	82	((CU&JU);(BD&CW)).
1249	82	CU&JO.	1250	82	DI"KR.
1251	82	FQ"((AV;CM)!AZ).	1252	82	NE"(EQ!AA).
1253	63	FP"RR.	1254	82	FR?QG.
1255	82	QS"(BE&MM).	1256	82	EB?(AE+GO).
1257	82	CL<WU.	1258	81	CQ"QT.
1259	81	FS;ER.	1260	81	1K'.
1261	81	CT"((DO;BC);DA).	1262	81	CY&JT"GR.
1263	81	DJ&(FQ"AR)!BJ.	1264	81	AA&QY!FU.
1265	81	SD^((AV;CM)!AZ).	1266	80	KI<(DJ&KA).
1267	80	NO"(HR;FP).	1268	80	CT<(GA&PK).
1269	80	QB<(KX;KS).	1270	80	CO&(AQ[BE).
1271	80	NE"(CR;CK).	1272	80	1G'.
1273	80	OT"HN.	1274	80	CZ"(CR&FP).
1275	80	CQ"Y.	1276	79	EP&RI.
1277	79	CU;JVIKH.	1278	77	BN[((AA&NK);DA).
1279	79	CP"JW.	1280	79	SI;GW.
1281	79	SFIGG.	1282	79	CL<((FE&QQ)!CX).
1283	45	KI"UG>NQ.	1284	78	LL>AR.

1285	78	CQ"((CU;FO)ICX).	1286	78	CW;CW.
1287	78	JS;DR"FT.	1288	78	HB"(GJ&CN).
1289	78	HY[(-1&CK).	1290	78	XF"AU.
1291	78	FW"(AT&JM).	1292	78	FS"(BC^DQ).
1293	78	LH"SE.	1294	77	CU;FO!CX.
1295	77	ED"(CV;KH).	1296	77	FQ"(AY&DH).
1297	77	QQ;JO"OC.	1298	77	QH"(GT;FO).
1299	77	QC"SQ.	1300	77	CL<EH.
1301	77	QS"(FO&JW).	1302	77	VO!GG.
1303	77	VC'.	1304	77	MA"WZ.
1305	77	HJ](-1&OK).	1306	76	CQ<HQ.
1307	76	EH'.	1308	76	DP[(CY!-1)@CE).
1309	76	SD^AW.	1310	75	JL"FI;RD.
1311	75	CL<(DA;CK).	1312	75	BN[(FO;CV).
1313	75	QO"EY;KH.	1314	75	SS"EE.
1315	75	CU&(HB"CY).	1316	44	CL<((DF"DF);DO).
1317	75	NT"((HPECW)!FU).	1318	75	ZC'.
1319	74	DP[CK"QLIDO.	1320	74	DI"(SWIBH).
1321	74	LI^JL.	1322	74	JT"OK.
1323	47	CL<(BD&BI).	1324	74	SI'.
1325	74	FS<(DD&OA).	1326	74	OO!QC.
1327	73	PZ"(LQ;FP).	1328	73	ZLIDO.
1329	73	ED<((DU;MP)!RJ).	1330	73	CL<(KX;KS).
1331	73	AN"AS&QB.	1332	73	IA'.
1333	70	HB<((OY!AA);NR).	1334	72	FP"OX.
1335	72	UV"OM.	1336	71	OG"IS.
1337	71	JK;GT.	1338	71	BJ;CK.
1339	71	DI<ZV.	1340	71	FQ<1A.
1341	71	AN<QU.	1342	71	FE^QQ!CX.
1343	71	KI<(CO&(CW"BW)).	1344	70	DI"KP.
1345	70	DI"(JN;CK).	1346	70	NF&(BG@GA).
1347	70	PE"CT.	1348	70	RG'.
1349	70	GS&OF.	1350	70	YL;QE.
1351	70	CL<(FP&RD).	1352	70	GL[(-1&CV).
1353	70	CT<(BJ&NU).	1354	67	NS[(GA&PK)>GP.
1355	70	KF>CK;FO.	1356	70	AY;DF!JO.
1357	70	CQ"(CK&QB).	1358	69	CQ<(JU&VO).
1359	69	CQ"OJ>FY.	1360	69	KK&QF.
1361	69	KY[(DA!BF).	1362	69	CP"BA.
1363	69	WU"OK.	1364	68	FR?JK.
1365	68	GY"FT.	1366	68	CP"JP.
1367	68	VI"FY.	1368	68	LV"CT.
1369	68	QK[(-1&DE).	1370	68	TJ'.
1371	68	TJ"IC.	1372	68	FR?XG.
1373	68	NF&PG.	1374	67	CL<ZA.
1375	67	AN<(CG@((AA&DH)).	1376	67	PJ"BA!JQ.
1377	67	WX"SE.	1378	67	NE"(CY;CK).
1379	67	KG&UI.	1380	66	BT'.
1381	66	UV"AU.	1382	66	SO!FU.
1383	66	FR?((JU;GA)!FZ).	1384	66	CQ<(CR&(HY[DG)).
1385	66	CL<AP.	1386	66	VR"((CU&OV)!ER).
1387	66	CT"KO.	1388	66	XG'.
1389	65	SV"(AC]GA).	1390	65	MT'.
1391	65	FO;JU!BA.	1392	65	CP"HA.

1393	45	XK?(-1<UK).	1394	65	QB"(BM;CK).
1395	65	SJ&(QH"(DA;CK)).	1396	65	CK<(CO&(DA;CK)).
1397	65	CQ<(DC[XR).	1398	52	TQ"FY.
1399	65	CMe(OZ^BW).	1400	65	FO<XU.
1401	65	CQ<(DT;RM).	1402	65	CQ"KV.
1403	65	HV'.	1404	65	PG>AR.
1405	65	HW"(GU;GU).	1406	65	AP&BD;NE.
1407	65	1C;DL.	1408	64	CU&SU.
1409	64	DD&((CR;BL)"UE).	1410	64	UG"(CX&JR).
1411	64	QC"((CO&GC)!CK).	1412	64	QO'.
1413	64	PZ"(JZ\$(AC>-1)).	1414	64	LT'.
1415	64	CO&QQ!JO.	1416	64	NN"KO.
1417	64	CZ"FY.	1418	64	AN<(CH"BK).
1419	64	CQ"(DP[NI).	1420	63	SV"LD.
1421	63	NH&(CZ"UW).	1422	63	FQ"DO.
1423	63	EP&SE!CN.	1424	63	EM;FP.
1425	63	JS;AX.	1426	63	SJ;QV.
1427	63	CZ"KL.	1428	59	QC"GR.
1429	63	NE<(CO&TO).	1430	63	JO&FQ.
1431	62	AN<LL.	1432	62	GZ"CT.
1433	62	FR?HL.	1434	62	FQ<(FR?NL).
1435	62	CL<(GK[GP).	1436	62	FO!AA;QD.
1437	62	QU'.	1438	62	NE"(CR&(NM;FO)).
1439	62	IS'.	1440	62	NW'.
1441	62	JS;CV.	1442	62	GD'.
1443	61	QB'.	1444	61	NH;JT"UT.
1445	61	PZ"LA.	1446	61	RI"DQ;MQ.
1447	61	DI<SE.	1448	61	CP"PG>FT.
1449	61	QC"BP.	1450	61	DE&QB.
1451	61	FP"JR.	1452	61	CZ"WF>FT.
1453	61	SG"(JK;DH).	1454	61	HW"SW.
1455	61	DO;IQ.	1456	61	SI;QB.
1457	61	FO&SF.	1458	61	KI"QM.
1459	61	IC'.	1460	60	GF"UE.
1461	60	CG@((AA&-1)+WZ).	1462	60	DC[(AN"CN);PD.
1463	60	AN<CN.	1464	56	DI"(FO&JM).
1465	60	GF<(SD^UP).	1466	60	QM'.
1467	60	FP"(AY&BI).	1468	60	FR?(NH&(EP&BW)).
1469	60	CQ"GB.	1470	60	BF<SE.
1471	60	FQ<UM.	1472	60	NE"HA.
1473	60	SV"QA.	1474	60	BH^BE;OC.
1475	59	NK;JO!ER.	1476	59	DH"(GA;JO).
1477	59	AN<EL&OB.	1478	59	AN<EL;XQ.
1479	59	CP<QI.	1480	59	BN[(CU&VF)>AU.
1481	57	GB"GR.	1482	59	QQ"(JU&SS).
1483	59	SI;OB.	1484	59	NE<ZW.
1485	59	AN<(CK;IJ).	1486	59	NO<(NJ;QA).
1487	58	FP"(AT&JY).	1488	58	QN"(EM;FP).
1489	58	DC[WA.	1490	58	CC[GA.
1491	58	DE"CF.	1492	58	NE"(BJ;CK).
1493	58	CT"(OY!BC).	1494	58	CO&QL.
1495	58	AV&QS!CN.	1496	58	CU&(CT<XA).
1497	58	((RI"DQ);(FP"BH)).	1498	58	AN<(NJ;QA).
1499	57	LI^EA.	1500	57	OA"CN.

1501	57	PZ"(CU&(AQ[CK])).	1502	57	JO;FP"UE.
1503	57	CU;EC!EJ.	1504	57	HB"(GJ&CN);QS.
1505	57	NF&YM.	1506	57	PZ"OK.
1507	57	HB"CY.	1508	57	AN<PZ>SF.
1509	57	QX"(JU&(AO]NO)).	1510	57	WTIGA"GP.
1511	57	CU&(OS&JT).	1512	56	CL<LD.
1513	56	CQ<YA.	1514	56	DH"(IB;JQ).
1515	56	JU&(PZ>AR).	1516	56	FP"DO.
1517	47	CQ<YU.	1518	56	CQ"((BD;BC);FP).
1519	56	DN<(NN;(CW"GI)).	1520	56	SG"(CR;BL).
1521	56	CL<SE.	1522	56	DN"(AQ[GF).
1523	56	AN<OM.	1524	56	WG'.
1525	56	BF<GR;CP.	1526	56	PZ"((OE"OE);QB).
1527	56	CU&(CR&(HY[CK))).	1528	55	CP"JY.
1529	55	DD&(BN[GF).	1530	55	DT;CK"LQ.
1531	55	CP"BA!FU.	1532	55	ZU"AU.
1533	55	PZ"(CY&CN).	1534	55	XI'.
1535	55	OO]OB.	1536	54	FQ<(HH&(BD&FW)).
1537	54	DP[CK"QL;FQ.	1538	54	LN<VG.
1539	54	LL"HL.	1540	54	CL<QT.
1541	54	NE"UK.	1542	54	QQ!JO.
1543	54	CL"(GJ&CV).	1544	54	CU&(QO"EY)!KH.
1545	54	HW>AR;OB.	1546	54	DT>AR.
1547	54	CP"CV.	1548	54	CU;AA;DU!DE.
1549	54	JZ\$PJ.	1550	54	NE"SF.
1551	54	AF+LK.	1552	35	FO<NH.
1553	54	CQ"(OH;BA).	1554	54	CO&FF.
1555	53	OJ<((AE?CY)+EB).	1556	53	BN[(VN;FO).
1557	53	FR?(CU&QC).	1558	53	AN<((CW"GI);FP).
1559	53	CT"(DA&GI).	1560	53	CL<(CO&(QQ!JO)).
1561	53	QB"((AV&NM)!FO).	1562	53	CM@CX!FU.
1563	53	AY&IQ.	1564	53	AE&GD;LR.
1565	52	CL"JK.	1566	52	CU&(CL<(QT;CN)).
1567	52	NS[(-1&(JO;FQ)).	1568	52	CU&VA.
1569	52	FQ"FY.	1570	49	DG"RK>RK.
1571	52	QO"BA;QB.	1572	52	NF&(FP"JQ).
1573	52	QC"KV.	1574	52	CQ"(JU&SS).
1575	52	AN<CV.	1576	52	OC'.
1577	51	CQ<(KK&(DL"FY)).	1578	51	IB;JQ.
1579	51	CP"RA.	1580	51	CL<(LZ;JO).
1581	51	FP"FG>BK.	1582	51	XJ'.
1583	51	CL<XL.	1584	51	CQ<(KG!DE).
1585	51	DN"MW.	1586	51	NO"JP>FQ.
1587	51	GB'.	1588	51	KG&(QN"DL).
1589	51	CQ"(CR;CK).	1590	51	SV"NO.
1591	51	JL<(EO&FQ).	1592	51	GO"AS&NE.
1593	51	LI^GH.	1594	51	MV"BA;UN.
1595	51	UY!FU.	1596	50	FO"FO!KH.
1597	47	DD&(DA&GZ).	1598	50	FP"(AV&KE).
1599	50	GF"(NS[(JO;KH)).	1600	50	FO;HQ.
1601	50	CT"(HQ;JK).	1602	50	CQ"(CK;FQ).
1603	50	CK<XV.	1604	50	AE&KH.
1605	50	CE@BX;AZ.	1606	50	QK[(-1&DE).
1607	50	CL"SY>FQ.	1608	50	OC!AY!IO!AP.



1609	50	RO"(BL&LY).	1610	50	AN<((JN;FO)!FU).
1611	50	HP@QQ!CF.	1612	49	CZ"KP.
1613	49	LQ;FP.	1614	49	NE"FW.
1615	49	AK+JV.	1616	49	SG"BT.
1617	49	GO&GC!CK>AR.	1618	49	((CO&CU)&(QE+AB)).
1619	49	NF&(PP"(HX;FO)).	1620	49	DN"(HX;FO).
1621	49	JU&SF.	1622	49	DN<UY.
1623	49	NE"(EX;NX).	1624	48	AN<(CK;FP)!DO.
1625	48	DG<((AP;CU);QB).	1626	48	FQ<((CU;FO)!CX).
1627	48	FR?NN.	1628	48	CU&GX.
1629	48	DN<((AP;CU);QB).	1630	48	CL<(AO)OT).
1631	48	NF&(QO"EY)!KH.	1632	48	KY[XW.
1633	48	SG"UP.	1634	48	FO;(FO"FO).
1635	48	CQ"(IG;FQ)>FT.	1636	26	CL<GD.
1637	48	SE!CK.	1638	43	VW>AR.
1639	48	JL"KO.	1640	48	CN'.
1641	48	DG<NQ.	1642	48	SV"GR.
1643	48	CQ<(AY&(DF"SE)).	1644	47	SD^EF.
1645	47	CQ"(AV&GQ).	1646	47	AN<GU.
1647	47	CP"EM.	1648	47	((RI"DQ);(JP"FQ)).
1649	47	CQ"MC.	1650	47	CL<(VY!FO).
1651	47	FG"LU>BK.	1652	47	YB'.
1653	47	NE"YP.	1654	46	MU"(IG;EJ).
1655	47	DN<(OU;(BC^DQ)).	1656	47	FR?((JK;FW)"FT).
1657	47	DC[(AN<SE)&WZ)].	1658	47	NO"YP.
1659	46	CL"RQ>AU.	1660	46	AN<(GK[KJ]).
1661	46	DP[(AV&GQ)].	1662	46	CU&(AO)QT).
1663	46	DN"(CU&UF).	1664	46	EB?(AE+CY).
1665	46	NO"(JO&NE).	1666	46	CL<ZU.
1667	46	FP"(JO;FP).	1668	46	RK"RK.
1669	46	SJ&SE.	1670	46	DN"((CU;EC)!EJ).
1671	42	TR>AR.	1672	46	CZ"((AA&DU)IDE).
1673	46	JQ<(SE!GG).	1674	46	FP"((BO;HS);NX).
1675	46	JD?(-1<OC).	1676	46	QA"WZ.
1677	46	GF;GF.	1678	46	PZ"RL.
1679	45	CQ"(CU&(CR;CK)).	1680	45	CL<UM.
1681	45	CK<DO.	1682	43	(JL;RD)"(BM;CK).
1683	45	NF&ZM.	1684	45	HX;BC;IX.
1685	45	AN<NV.	1686	45	(CR;CK);KH.
1687	45	ED"NL.	1688	45	DB;CX.
1689	45	FI'.	1690	45	AN<(FO;IB).
1691	45	CQ<(NT;(NT"NT)).	1692	45	CL"PJ>BA.
1693	45	OOJFP.	1694	45	CL<(AA&BZ).
1695	45	NE"(BG@DJ;EC)).	1696	44	GX;QB.
1697	44	AV&GQ"MJ.	1698	44	CL<(HH&(BG@JP)).
1699	44	CQ"(AT&CS).	1700	44	NS[(-1&(JO;KH)).
1701	44	NF;EH.	1702	44	OQ"(BD&QC).
1703	44	RT!FU.	1704	44	VP](AW"-1).
1705	44	CQ<YW.	1706	44	CL<YW.
1707	44	QH<(GU;GU).	1708	44	SK"GR.
1709	44	IG&TS.	1710	44	KT"KV.
1711	44	UG"MI.	1712	44	CQ"EM.
1713	44	CU&LH.	1714	44	UE'.
1715	44	DP[IH.	1716	44	DD<(WV!BC).

1717	43	SU;FU.
1719	43	HT'.
1721	43	RA"FP.
1723	43	JL"VQ.
1725	43	NO"(JK;FS).
1727	43	CL<(FC&(BD;BA)).
1729	43	AO](BX@CE).
1731	43	QKE(-1;JQ).
1733	43	LS;FP.
1735	43	XZ"QL.
1737	43	LH"WZ.
1739	42	SJ&(UV"FP).
1741	42	ED"BW.
1743	42	NN"JN.
1745	42	SG"UI.
1747	42	CP"(HV;FO).
1749	42	WA'.
1751	42	DN<(EO&FQ).
1753	42	FQ<(AO](CE@BX)).
1755	42	JL"LA.
1757	42	CL<(GO;EV).
1759	42	CU&(MU"(IG;EJ)).
1761	42	FR?((AV&QS)!CN).
1763	42	CK<OM.
1765	41	KY[KP.
1767	41	RN"(JK;AZ).
1769	41	PZ<(EB?(AE+GO)).
1771	41	DI"(DC[(ID;CK)).
1773	41	JS&(BD&IH).
1775	41	DI<GO.
1777	41	KI"HA.
1779	41	JU&SU.
1781	41	FO<LE.
1783	40	LO'.
1785	40	JQ<KN.
1787	36	FQ<(IL[(BH&PZ)).
1789	40	BN[(CU&VF).
1791	40	DD&QF"BI.
1793	40	ZM;OB.
1795	40	SG"(EO&FQ).
1797	40	DG<HA.
1799	40	QS"(HX;FO).
1801	40	HI&(NT"CT).
1803	39	EP^APIER.
1805	39	CR;AD&QB.
1807	39	RN"NLIDO.
1809	38	YM>AR.
1811	29	SO!CN"MJ.
1813	39	CL<(UO;FP).
1815	39	KY[FY.
1817	39	YZ'.
1819	38	CL<(KK&(DL"FY)).
1821	38	FQ"UW.
1823	38	(BF"RO)>(BL&JM).

1718	43	DC[(SR;KI).
1720	43	QH"(AF+HG).
1722	43	NS[(JO;FU).
1724	43	OT"DE.
1726	43	NU;JO!AU.
1728	43	JL"(BX&(AQ[DH)).
1730	43	QJ?(-1<(EO&FQ)).
1732	43	DC[(UQ"CN).
1734	43	CL<(CO&QU).
1736	43	KI<((AY;IO)!AP).
1738	43	NO"HO.
1740	42	DI"QD.
1742	42	CL<((NH;FO)!AP).
1744	42	BG@DJ;DD).
1746	42	CL<VA.
1748	42	NE"BU.
1750	42	MR;CP.
1752	42	CL"FP>JQ.
1754	42	NF&ZD.
1756	42	DD&(CO&JT).
1758	42	ZD'.
1760	42	JK;BR.
1762	42	KF"(JL;CP).
1764	41	DI<(NZ!AP).
1766	41	XQ"GP.
1768	41	DC[(SY"FP).
1770	41	AO]JO.
1772	41	QZ"(BJ&QB).
1774	41	SG"(DP[JP).
1776	41	JL"GF!FU.
1778	41	CL<(JU&SS).
1780	41	PS;FP.
1782	41	DO;DG!FZ.
1784	40	FS<UG.
1786	40	CK;FP.
1788	40	QN"SI.
1790	40	BD&(JA?CN).
1792	40	CL<(GU;GU).
1794	40	(CR&FP)"HT.
1796	40	BM&QB.
1798	40	GJ&DR>AI.
1800	40	CO&TO.
1802	40	DN<SE.
1804	32	SG<VE.
1806	39	JB^CM.
1808	39	NU;DE"FY.
1810	39	XM'.
1812	39	HW"PH.
1814	39	OE"OE;QB.
1816	39	FQ"(NH;CP).
1818	39	NE"HO.
1820	38	SD^NO.
1822	38	CL<(CR&FP)!DO.
1824	38	CL<(NW&QV).

1825	38	NE"(GJ&(EH[BA))).	1826	38	HV;FO.
1827	38	CL<(FO;HQ).	1828	38	NQ"CT.
1829	38	ZO"FY;SG.	1830	38	OQ"(OC;SE).
1831	38	PZ"(JO;FQ).	1832	38	LV;DD.
1833	37	CQ"MQ.	1834	37	SV"(AV&GQ).
1835	37	FQ"LL.	1836	37	KI<UG.
1837	37	JC[JQ.	1838	37	JL"HA.
1839	37	CU&(CL<UM).	1840	37	((CQ"RO)>(BL&JM)).
1841	37	NO<((DU;MP)!RJ).	1842	37	XI'.
1843	37	MS;BC;FQ.	1844	37	QO"EY!KH.
1845	37	DN"(CR;CK).	1846	37	HX&(BC^EI).
1847	37	FR?DU.	1848	37	JL"(AF+HG).
1849	37	SY"FQ.	1850	37	AN<FI.
1851	37	AN<((JN;FO)!FU).	1852	22	IC'.
1853	36	NF&KU.	1854	36	CL<(NH;JT).
1855	36	NO"UG.	1856	36	CZ"(DD&XQ)>FT.
1857	36	DH"EW.	1858	36	CP"FW.
1859	36	CQ<(IL[(BH&PZ))).	1860	36	CQ<OX.
1861	30	FQ<((DU;MP)!RJ).	1862	36	SJ&(QH"(DA;CK)).
1863	36	ED"RA.	1864	36	RU'.
1865	36	JS!BD;QG.	1866	36	QC;(QC"QC).
1867	36	FV]CU.	1868	36	CU&(PP"(HX;FO)).
1869	36	BR"BJ.	1870	36	FO<(GC&FQ).
1871	36	WJ'.	1872	36	FP<(FV]CU).
1873	36	UU"(AA&NE)!FU.	1874	36	CT"((JN;FO)!AP).
1875	36	FR?(DP[(MS;GI))).	1876	36	((ED"NZ)>(AA&DH)).
1877	36	NO"(CO&AS).	1878	36	CL<IZ.
1879	32	DD&KI.	1880	36	WV!BC.
1881	35	FR?(GA;JO).	1882	35	DC[(SR;VU).
1883	35	CK<(CU&FF).	1884	35	TU?(-1<AU).
1885	35	CQ<HG.	1886	35	KI<(DD&(BN[GF))).
1887	35	CU&SH.	1888	35	DN<(QZ"(BJ&QB)).
1889	35	SD^(DA;CK).	1890	35	JN;FO!AP"YQ.
1891	35	JS;DR"CT.	1892	35	QN"DL.
1893	35	CO&(JA?(BM;BA)).	1894	35	OY;BC.
1895	35	CQ"VA.	1896	35	NE"(JK;FW)>FT.
1897	35	XX'.	1898	35	((CR&FP)"(BM;BA)).
1899	35	FR?(DC[(GS!GG))).	1900	35	FR?(CQ"GB).
1901	35	GY"JW.	1902	35	ED"PZ>GP.
1903	35	WV;(BC&PZ).	1904	34	RQ"AU.
1905	34	FS"JK;KI.	1906	34	CL<((CU;FO)!CX).
1907	34	LZ;QB.	1908	34	AN<GP.
1909	34	CU&(AO]OT).	1910	34	CQ"(AE+BR).
1911	34	UG"(CO&AS).	1912	34	CO&IM.
1913	34	GF"UP.	1914	34	VU'.
1915	34	CZ"WK>EG.	1916	34	JT"UI.
1917	34	GK[(-1&FQ).	1918	34	SM;NX.
1919	34	DP[(DD;DD).	1920	34	NS[(-1&KA).
1921	34	NE"(BG&(EA;CK)).	1922	18	CU;JU;SF.
1923	34	PQ"FQ!DO.	1924	34	AN<GN.
1925	34	DP[JT"CN!FU.	1926	33	QL"CB>QL.
1927	33	DI"QT.	1928	33	CT"(JN;CK).
1929	33	(CU;FO),(EP;IX).	1930	33	SG"(DA;GZ).
1931	33	NF&(CR;CK).	1932	33	(CU;HH);(BD&DH).

1933 33 DI"(AY&BI).  
 1935 33 CY;BD;QY.  
 1937 33 AU"CM;UG.  
 1939 33 BC&VV.  
 1941 33 NE"ZF>GU.  
 1943 33 CQ"(HH&(BG@JP)).  
 1945 33 AN<GD.  
 1947 33 XU'.  
 1949 33 NO"OM.  
 1951 32 AN<(JN;CK).  
 1953 32 FP"FT.  
 1955 32 ZK"(CR;BL).  
 1957 32 ED"FS.  
 1959 32 GZ"GZ;FD!FU.  
 1961 32 FQ"(KG;DE).  
 1963 32 EO&FQ>AR.  
 1965 32 PZ"KW.  
 1967 32 GK[OC.  
 1969 32 SJ;(LS"(DA;AU)).  
 1971 31 BY@AZ.  
 1973 31 QJ?BS.  
 1975 21 LC'.  
 1977 31 KG;DE.  
 1979 31 JT"CT.  
 1981 31 CL"MC;FP.  
 1983 31 NP;KR.  
 1985 31 CK&(AE+CY).  
 1987 31 BF<GR;MJ.  
 1989 31 CY&CN.  
 1991 31 CU&CI.  
 1993 31 BN[(AN<SE).  
 1995 30 AN<(AV&GQ).  
 1997 30 BF<UG!FU.  
 1999 30 CL"((FO;JU)!BA).  
 2001 30 NN;JO!NV.  
 2003 30 KR'.  
 2005 30 CK<BT.  
 2007 30 CK<JR.  
 2009 30 AN<((MN!GG)!KH).  
 2011 30 WU"OK.  
 2013 30 XJ!DQ.  
 2015 30 GF<(UO;WP).  
 2017 30 JS;FZ.  
 2019 30 FR?(GJ&OT).  
 2021 30 CP"OM.  
 2023 29 UV<(AN"QM).  
 2025 29 CU&FW.  
 2027 29 FP"(BG@GA).  
 2029 29 PZ"HZ.  
 2031 29 NE"(DA;CM).  
 2033 29 CK<JP.  
 2035 29 CQ"(MR!IJ).  
 2037 29 XQ"(CR;AD).  
 2039 29 CQ"GB!CK.

1934 33 AU"CM;QB.  
 1936 33 OS^JT.  
 1938 33 CU;SE!GG.  
 1940 33 OZ^GW.  
 1942 33 JZ\$GA.  
 1944 33 JQ<(GJ&IE).  
 1946 33 AN"QB>AR.  
 1948 33 KG;GJ;OT.  
 1950 33 FR?VT.  
 1952 32 CL<(BJ;BA).  
 1954 32 FR?(DA;GZ).  
 1956 32 OT"ZU.  
 1958 32 NN"JP>FQ.  
 1960 32 CP"(CK;FQ).  
 1962 20 CL<HR.  
 1964 32 CU;DZ.  
 1966 32 DU;JO!FP.  
 1968 32 CQ"(RM;BA).  
 1970 31 AV&GQ.  
 1972 31 AT&JY"FT.  
 1974 31 RV'.  
 1976 31 MO;QB.  
 1978 31 CO&((DK;DB)"BA).  
 1980 31 UG"XT.  
 1982 31 JU;BM;FO!AP.  
 1984 31 AN<BP.  
 1986 31 OH;(CW"GI).  
 1988 31 KA;NJ!SM.  
 1990 31 CP<QA.  
 1992 31 CP"II.  
 1994 31 TB!BD;NO.  
 1996 30 CL"UQ>DQ.  
 1998 24 TJ"QT.  
 2000 30 CU;EC.  
 2002 30 RU"(GJ&CV).  
 2004 30 SI;JO.  
 2006 30 KI"GR.  
 2008 30 DN"(AT&JY).  
 2010 30 SG"GR.  
 2012 30 CO&BQ.  
 2014 30 UZ'.  
 2016 30 ED"(GC;FQ).  
 2018 27 (KI"RO)>>(BL&JM).  
 2020 30 CO&FO;CP.  
 2022 30 JL<ZG.  
 2024 19 NE"(JK;DH).  
 2026 29 QB"SF.  
 2028 29 FP"(BL&JX).  
 2030 29 KI"(IG;EJ).  
 2032 29 CT<ZM.  
 2034 29 (NS[SE]>>(AA&CF).  
 2036 29 CQ<(OZ^BW).  
 2038 29 SJ&VB.  
 2040 29 NE"IN.

2041 29 XB"FT.  
 2043 29 CU&OV!ER.  
 2045 29 (CO&KX);(BC&DO).  
 2047 29 DG<(BE&KF).  
 2049 29 CL<WL.  
 2051 28 QB<HL.  
 2053 28 PZ"(HR;FP).  
 2055 28 JO&NE.  
 2057 28 FR?ST.  
 2059 28 UG"XX.  
 2061 28 FQ"(AS;ID).  
 2063 28 KY[(RM;BA).  
 2065 28 NE<WS.  
 2067 28 RM;BA.  
 2069 28 SV"(JO&IK).  
 2071 27 DN<(AQ[DH).  
 2073 27 FR?(CU&VF).  
 2075 27 FR?(ID;LJ).  
 2077 27 SG"(AO+(AB"-1)).  
 2079 27 CK<(HH&(BD&DH)).  
 2081 27 CK<QI.  
 2083 27 NH;FP.  
 2085 27 DR"PM.  
 2087 27 ZQ'.  
 2089 27 AN<(BV&KF).  
 2091 27 CL"(FO;HQ).  
 2093 27 VQ"(BM&BA).  
 2095 27 (AN"AS)>UE.  
 2097 27 PZ"(AO]FO).  
 2099 27 DH"SL.  
 2101 27 GF"HA.  
 2103 27 VR"(AY&BI).  
 2105 27 OC;JO!NV.  
 2107 27 GV"UE.  
 2109 26 FS"HO>FS.  
 2111 26 CQ<(CU&JO).  
 2113 26 CQ<(SI;JO).  
 2115 26 VR"(DA;CK).  
 2117 26 LV'.  
 2119 26 CU;AY;DF!JO.  
 2121 26 CQ"GB&PZ.  
 2123 26 SJ&(FP"JQ).  
 2125 26 AV&NM;FO.  
 2127 26 DG<(DP[NI).  
 2129 26 JL<LE.  
 2131 25 DG<(DA!BF).  
 2133 25 CL<(SW!BH).  
 2135 25 OL'.  
 2137 25 CU&(NS[(JO;KH)).  
 2139 25 FP"JP.  
 2141 25 UV"(AO]NN).  
 2143 25 PZ"(CY;FU).  
 2145 25 CQ"(JN&QD).  
 2147 25 KY[(CR&(HY[CK)).

2042 29 CU&(DF"DF).  
 2044 24 CL<1D.  
 2046 29 VR<(FR?(ME;FQ)).  
 2048 29 DG<(JO;IK).  
 2050 28 UG"(GK[KJ).  
 2052 28 CQ<(SZ!GG).  
 2054 21 DG<WX.  
 2056 28 JL"AR;IM.  
 2058 28 CL<QR.  
 2060 28 FQ"(AP&BA).  
 2062 19 CQ" TJ.  
 2064 28 JS;DR"EE!DO.  
 2066 28 CP<(RM;BA).  
 2068 28 FO&(DE"BK).  
 2070 27 RS"FT;DH.  
 2072 27 CL<(QQ;JO).  
 2074 27 CU&JZ.  
 2076 27 CK<(SI;JO).  
 2078 27 PZ"((NH;FO)!AP).  
 2080 27 DP[SF.  
 2082 27 JL"AR;FP.  
 2084 27 DD&(CR&KJ).  
 2086 27 DT;CK>AR.  
 2088 26 SD^(CL"(DT;CM)).  
 2090 27 CL<(GK[(DG&GE)).  
 2092 27 NO"NQ.  
 2094 27 FR?(LM&LF).  
 2096 27 CZ<(BN[(AP&JQ)).  
 2098 27 JN;FO!AP>DQ.  
 2100 27 GF"(JU&(AO]NO)).  
 2102 27 CQ<((TK!FU)!DA).  
 2104 27 PR'.  
 2106 27 FP<(GN;CK).  
 2108 27 BE;AZ.  
 2110 26 KI<(HH&(BD&FW)).  
 2112 26 (CU;FO)! (EP;DO).  
 2114 26 DG"QZ>AR.  
 2116 26 OZ^BW.  
 2118 26 NO<VB.  
 2120 26 SG"HA.  
 2122 26 CP<(CO&(QQ;JO)).  
 2124 26 YE'.  
 2126 26 QS"((AY;IO)!AP).  
 2128 26 DI"(BE&KF).  
 2130 25 AN<(GJ&CV).  
 2132 25 BF<SN.  
 2134 25 DC[(PE"CT).  
 2136 25 FS<(IG;EJ).  
 2138 25 FQ"(DA;CK).  
 2140 25 CL<XU.  
 2142 25 AU&(AU"AU);FQ.  
 2144 25 QB<WA.  
 2146 25 CQ"MG.  
 2148 25 SV"XU.

2149	25	NE"(GU]AP).	2150	25	CQ"(BE&KF).
2151	25	TK;FUIDA.	2152	25	AN<(AT&JY).
2153	25	AA&QYIFU.	2154	25	CL"FS.
2155	25	CW"BW;FU.	2156	23	CL"((BL&JX);BJ).
2157	24	BC^BJ"UE.	2158	24	QL"PZ>QL.
2159	24	DP[CK"QL;PZ.	2160	24	CQ"HT.
2161	24	NE<VE.	2162	24	FQ<(OZ&UG).
2163	24	PZ"(AE+BR).	2164	24	SG<(FR?QC).
2165	24	FP<((CL<IT);FP).	2166	24	FS<(CR;BL).
2167	24	CL<(CR&KJ).	2168	24	QH<(EP&(AA&CF)).
2169	24	(DG"AN)>(BV&KF).	2170	24	AN<GF.
2171	24	JL<(CU&VS).	2172	24	DH'.
2173	24	CU&(AO]NN).	2174	21	ED<(OY!BC).
2175	24	DP[(EO&FQ).	2176	24	QS<(GL[(-1&CV)).
2177	24	SD^FQ.	2178	24	GQ>AR.
2179	24	AY&DF;JO.	2180	24	NK;GP.
2181	24	KI<(SR;LY).	2182	24	SG<(FR?NZ).
2183	24	SV"(AT&DH).	2184	24	CL<DD.
2185	24	NN"XG.	2186	24	DC[(QB"AR).
2187	24	YF'.	2188	24	AN"(GC;CJ)>FT.
2189	24	OC;ER.	2190	24	CL<KQ.
2191	23	FP<(HH&(BD&FW)).	2192	23	QQ;JO>CT.
2193	23	CL<(NH;JT).	2194	23	AN<QM.
2195	23	CL"WX>SE.	2196	23	CL<(JB;IX).
2197	23	CZ<QW.	2198	23	DL'.
2199	23	FS<(BD&QC).	2200	23	AN<(CO&QG).
2201	23	1B'.	2202	23	CQ"LC.
2203	23	AN<(OZ^BW).	2204	23	CW'.
2205	23	NJ;(CL"GR).	2206	23	FR?FA.
2207	23	TE'.	2208	23	FP"PH.
2209	23	AN<(SO!CN).	2210	23	CZ"TW>FT!FU.
2211	23	RT'.	2212	23	DG<NK.
2213	23	SG"((OE"OE);QB).	2214	23	CR&(HY[(-1&CK)).
2215	23	PZ"(CO&KQ).	2216	23	GN;CK.
2217	23	CQ"(KG;AG).	2218	23	QO"AW.
2219	22	QB<(JN;CK).	2220	22	SD^FU.
2221	22	CL<LG.	2222	22	NE<(FR?(DA&GZ)).
2223	22	DG"IN>UE.	2224	22	CQ"WX>SE.
2225	22	CQ"CK.	2226	22	CL<(LM;QB).
2227	22	QC"(CK&NT).	2228	22	KY[IA.
2229	22	CP<XX.	2230	19	1E'.
2231	21	CQ<((DD&SE)!RE).	2232	22	OK<OC.
2233	22	AN<(BM&QB).	2234	22	PZ"(BC^DQ).
2235	22	FP<KW.	2236	20	NT"FU.
2237	22	QS"VU.	2238	22	QJ?(-1<(BC^DQ)).
2239	22	LT"UM.	2240	22	DT;CK.
2241	22	FO;(AF+ER).	2242	22	FP<XT.
2243	22	QO"BA;QF.	2244	22	CL"CP.
2245	22	DG<IF.	2246	22	FP<((EM^BA);KH).
2247	19	DX"AS;FQ.	2248	14	SR>DQ.
2249	21	FP"LO.	2250	21	SD^((DP[CK)"QL).
2251	21	CU&(CL"EC).	2252	21	KY[UT.
2253	21	ED"GF.	2254	21	JK"(AO+(AB"-1)).
2255	21	QJ?(-1<SI).	2256	24	EP&JT.

2257 21 CQ<(EQ!AA).  
 2259 21 CL<(DP[ SJ).  
 2261 14 SG"(AO@BE).  
 2263 21 GU"AR.  
 2265 21 JL<(GM;(AS;FO)).  
 2267 21 OO]SE.  
 2269 21 WX"NL.  
 2271 21 NF&(ZF"GU).  
 2273 21 FP"GB.  
 2275 21 XD"(JZ\$GA).  
 2277 21 (JZ\$(AC>-1));KH.  
 2279 21 CL"(DJ&(DF"DF)).  
 2281 21 VJ"CT.  
 2283 21 CE@((DF"AJ)>DF).  
 2285 21 FX;KL..  
 2287 21 AO]BF.  
 2289 20 CQ"LL.  
 2291 20 1C;NO.  
 2293 20 AN<FW.  
 2295 20 QH<(FO&HF).  
 2297 20 CT<(AL?LO).  
 2299 20 TT&(NE"SE).  
 2301 20 DP[XB.  
 2303 20 NE"(BG@DJ;DD)).  
 2305 20 CL"EH.  
 2307 20 NO"DE.  
 2309 20 ((AA&DU)IDE)"AU.  
 2311 20 HY[(-1&CK)"CT.  
 2313 20 QH<XU.  
 2315 16 NE<ZC.  
 2317 20 KY[KL.  
 2319 20 GA&PK"NQ.  
 2321 20 FS"FS;LG.  
 2323 20 SG"(EO&QB).  
 2325 20 AN<(JL;CP).  
 2327 19 SG"LD.  
 2329 19 KP"UE.  
 2331 19 CQ<KP.  
 2333 19 FP<YA.  
 2335 19 SG"BT.  
 2337 19 RX'.  
 2339 19 FP<(SD^UP).  
 2341 19 FQ"EH.  
 2343 19 FP<(BY@LM;QB)).  
 2345 19 DG<(JS;AX)..  
 2347 19 CU&ZC.  
 2349 19 MG'.  
 2351 19 CK<ZV.  
 2353 19 NE"(CO&JT).  
 2355 19 CK<(CU&CI).  
 2357 19 PZ"(JL;EM).  
 2359 19 DI"PB.  
 2361 18 FQ<(QT!CN).  
 2363 18 CU&(CL<LA).

2258 21 CQ<((TB;BD)!AU).  
 2260 21 JQ<XW.  
 2262 21 FO;EH.  
 2264 21 CL"DE>WZ.  
 2266 18 SV"BI.  
 2268 21 SE!GG.  
 2270 21 CK&FQ"WZ.  
 2272 21 GY<ZR.  
 2274 21 CT<((HA;FO)!DB).  
 2276 21 CZ"(IG;FQ)>FT.  
 2278 21 CL<(SD^FS).  
 2280 21 CQ"(HX;FO).  
 2282 21 AN<VF.  
 2284 21 (XH;QF)"(JV;KH).  
 2286 21 KT"QU.  
 2288 21 (JN;FO)"(CK&QB).  
 2290 20 CU&LS.  
 2292 20 CU&(CL"BW).  
 2294 20 HI;GB.  
 2296 20 CQ"KI.  
 2298 20 AN<SQ.  
 2300 20 UG"(DA;CK).  
 2302 20 CL"(JK;AS)"MF.  
 2304 20 DD;FO!HQ.  
 2306 20 CK<(PL!CX).  
 2308 20 DY!FU.  
 2310 20 FP<(LS&RE).  
 2312 20 BC&GO.  
 2314 20 QK[(-1&(EQ!AA)).  
 2316 20 CP<NI.  
 2318 20 DG<1I.  
 2320 20 SG"RC.  
 2322 20 YC'.  
 2324 20 ZP'.  
 2326 19 VG'.  
 2328 19 AN<(HH&(BD&FW)).  
 2330 19 UQ"DQ.  
 2332 19 CU&(CL<QT).  
 2334 19 DP[NV"FY.  
 2336 19 VK?(-1<(BE;DG)).  
 2338 19 IN'.  
 2340 19 CL<(NS[(JO;FU)).  
 2342 19 FP"(DE&QB).  
 2344 19 FP"(FO;HQ)..  
 2346 19 AN<YM.  
 2348 19 QC"(SO!CN).  
 2350 19 WN'.  
 2352 19 NE<WS.  
 2354 19 GF"((MV"BA);NN).  
 2356 19 JN;NX"FY.  
 2358 18 NF&ZY"UE.  
 2360 18 CU&(AO](GA;JO)).  
 2362 18 NO"GZ.  
 2364 18 SV"((FO;JU)!BA).

2365	18	AE+DZ.	2366	18	AN<(DC[(AN<CN)).
2367	18	FR?(CC[(NS[BI])).	2368	18	NF&(BJ;CM).
2369	18	CQ<(EB?(AE+CY)).	2370	18	RN"NL!FU.
2371	18	DN"VU.	2372	12	NE"(CM@FP).
2373	18	CK"DR>AI.	2374	18	FR?NR.
2375	18	HC"VU.	2376	18	JE?(-1<(FR?NP)).
2377	18	QC+CE"FY;NE.	2378	18	AY&DF.
2379	18	AS;FO.	2380	18	JL"SE.
2381	18	OJ'.	2382	18	FQ"SL.
2383	18	SI;AS!FO.	2384	18	AN<((SI;AS)!FO).
2385	18	DP[OV.	2386	18	QO"BA;FQ.
2387	18	JU&(AO]NO).	2388	11	QH<WS.
2389	18	OJ"(RM;BA).	2390	18	FS"((OH;FU)!DA).
2391	18	DW"FT!FU.	2392	18	KY[(OZ&RA).
2393	18	YR^(-1&QB).	2394	18	CU&SZ!GG.
2395	18	AN<UH.	2396	18	FP"UY.
2397	18	QU"GR.	2398	17	DG<BQ.
2399	17	GK[KJ.	2400	17	CQ"MT.
2401	17	FQ"FW.	2402	17	JT<ZD.
2403	17	SW!BH"UE.	2404	17	XY'.
2405	17	QH"((AV&QS)ICN).	2406	17	QH"((HH&BD);DH).
2407	17	JS!BD!BT.	2408	17	CK<DO.
2409	17	CT"(CO&AS).	2410	17	SG"HZ.
2411	17	CP"(DP[AS).	2412	17	QS"ZV.
2413	17	(FP;JT)"(ID;LJ).	2414	17	DC[(OC;(BC^DQ)).
2415	17	PZ"(JS;DB).	2416	17	SG<(JU&(NE"SE)).
2417	17	SG"RG.	2418	17	NN"(NJ!GG).
2419	17	FP"LQ.	2420	17	OD>AR.
2421	17	UJ'.	2422	17	AN<(CK;EJ).
2423	17	NF&(DN<HN).	2424	16	SG"RR.
2425	17	DF"AC.	2426	17	HQ;JK.
2427	17	CU&(AU"CM).	2428	17	CU;LC"FT;GW.
2429	17	FQ"(JK;GT).	2430	10	WM"AU!GG.
2431	17	QH"GO.	2432	17	DD"(CY&CN).
2433	17	CK<IP.	2434	17	QK[(-1&DE).
2435	17	AN<(TV;MM).	2436	17	FP"(IG;EJ).
2437	17	CQ"XI.	2438	17	TL!FU.
2439	17	SG"((OE"OE);QB).	2440	17	GO"AS"SE.
2441	17	FQ"(IL[(-1&BW)).	2442	17	CQ"(HX&FQ)>FT.
2443	17	DI<HM.	2444	17	PZ"(BQ&BE).
2445	17	ED"(AV&QS).	2446	17	CL<(EP&KZ).
2447	17	QB"QB;CP.	2448	17	QH"(OC;SE).
2449	17	DC[(ID;JX).	2450	16	DD&(FQ"FQ).
2451	16	SG"(GC;FZ).	2452	16	FQ"UQ>DQ.
2453	16	CZ<(GK[KJ).	2454	16	DG<(DC[SR).
2455	16	CZ"FW.	2456	16	JQ<(KK&QF).
2457	16	GS'.	2458	16	DI"JN.
2459	16	DG"QD.	2460	16	NS[(JO;AU).
2461	16	NO"(CR;CK).	2462	16	TZ'.
2463	16	TY'.	2464	16	BD;BH;EH.
2465	15	CK<(GS&OF).	2466	16	SD^FO.
2467	16	DD"(CX&JR).	2468	16	GR'.
2469	16	CO&(EO&FQ).	2470	16	FR?(DR"(AA&NE)).
2471	16	CQ"AI;NE.	2472	16	FO"(BJ;CM).



2473	16	IY'.	2474	16	NE"(DC[(XQ!DO)).
2475	16	CP"(SI;DH).	2476	16	OU;(BC^DQ).
2477	16	OA;CP.	2478	16	GF"(CO&QU).
2479	16	QQ'.	2480	16	CQ"SK>GB.
2481	16	OW'.	2482	16	YD'.
2483	16	CP"PR.	2484	16	CQ<(EP&KZ).
2485	16	PU"FY.	2486	16	FO"(GN;CK).
2487	16	DP[(-1&JT)"CN.	2488	16	FF'.
2489	16	CP"RL:	2490	16	DD&((ED"PZ)>GP).
2491	15	SJ&LD.	2492	15	QH"(DD&(FQ"FQ)).
2493	15	JT"LG.	2494	15	DH"JK.
2495	15	NO"(HH&(BD&FW)).	2496	15	SG"QT.
2497	15	SG"(CW;CK).	2498	15	(CU;FO);(EP;AU).
2499	15	CL"(AE+DZ).	2500	15	DI<((AP;CU);QB).
2501	15	CZ"PA.	2502	15	CL"GR!KH.
2503	15	FQ"(BE;CM).	2504	15	KY[(GF;GF).
2505	15	JE?(-1"(GF;GF)).	2506	15	CL"(JN&QD).
2507	15	CK<(DP[AS).	2508	15	NO<(JL"AR).
2509	14	ED"QD.	2510	15	WU"(NN;(CW"GI)).
2511	15	CL"JP.	2512	15	(CU;JO)IFP.
2513	15	(DE"EW)&UV.	2514	15	KY[NL.
2515	15	ED"PM.	2516	15	BY@CL"SE).
2517	15	GF"(JK;FS).	2518	15	PZ"((CU;EC)!EJ).
2519	15	DG<ZX.	2520	15	UP'.
2521	13	XD"YM.	2522	15	JN"(GC;FQ).
2523	15	DN"((JQ"JQ);SE).	2524	15	ZX'.
2525	15	GZ"BJ;CX.	2526	15	SG"LQ.
2527	15	OZ^BJ.	2528	15	QQ!FU.
2529	15	NE"(AY&DF).	2530	15	CU&(NZ"QL).
2531	15	CQ"AI.	2532	15	(CO;KX);(BC;FP).
2533	15	IL[(BH&PZ).	2534	15	FP"DQ.
2535	15	DN"(SW!BH).	2536	15	CL"QZ>FT.
2537	15	CQ"(LS;FP).	2538	15	UV"EQ.
2539	10	FP"(CO&JT).	2540	15	QH"NH.
2541	15	DN"QC>GB.	2542	15	CQ"(QK[(-1&DE)).
2543	15	CK<SE.	2544	14	DI<(SJ;(UV"FQ)).
2545	14	EX;LJ>AR.	2546	14	PZ"((DJ&KA)!FO).
2547	14	(CO;CU)&(FO;CX).	2548	14	CK<NN.
2549	14	CK<WZ.	2550	14	SD^(AN<GU).
2551	14	CL"PA.	2552	14	NE<(FR?(DA&GZ)).
2553	14	QH"(GJ&NU).	2554	14	FR?QF.
2555	14	KK&QF!BI.	2556	14	BG@EA;CM)"SE.
2557	10	CP"GK.	2558	14	CU&UF.
2559	14	1J'.	2560	14	DP[GT.
2561	14	CP"(GL[AS).	2562	14	CK<QD.
2563	14	CL<SR.	2564	14	XJ"(NN;(CW"GI)).
2565	14	KI"(EX&LJ).	2566	14	QH"(IL[(-1&BW)).
2567	14	DN"(JK;AS)>MF.	2568	14	KT"(DC[QC).
2569	14	DN"((JZ\$GA)!FU).	2570	14	FP<XR.
2571	14	AA&DUIDE"UE.	2572	14	WA"GR.
2573	14	HJ]((AA&DU)IDE).	2574	14	GP'.
2575	14	QX"(BJ;GI);NO.	2576	14	(CU;NH);(FO;AP).
2577	14	FP"(KG&KC).	2578	14	NO"PH.
2579	14	BM;FO!AP.	2580	14	CL"(IG;FQ)>FT.

2581	14	QV'.	2582	14	AN<(CY&CN).
2583	14	QB<(FV]AP).	2584	14	UG"(SM;NX).
2585	14	SG"((OE"OE);QB).	2586	14	YC'.
2587	14	FR?(TC+AB).	2588	14	GF<UM.
2589	14	KT"(TT;(JZ+AH)).	2590	14	CP"(CO&(CW"BW)).
2591	14	CK<((BH&BE);OC).	2592	14	CZ"RW>BK!JT.
2593	14	CL"GV.	2594	13	CQ"GX.
2595	13	DC[ZM.	2596	13	FQ"VG.
2597	13	NT"(KV;CF).	2598	13	DL<YV.
2599	13	DI<(FO&OC).	2600	13	CQ<(AO]OT).
2601	13	DN<(DU&PW).	2602	13	QZ>AR.
2603	13	CK<QD.	2604	13	HA;AU.
2605	13	HJ](-1&(EX&LJ)).	2606	13	CU&IA.
2607	13	KF"MC.	2608	13	AN<(BE&MM).
2609	13	JT"GB.	2610	13	QN"XT.
2611	13	TX"EI!GG.	2612	13	FR?(FO&SE).
2613	12	CZ"SG>EG.	2614	13	AO]FO.
2615	13	NO"KF>CK.	2616	13	CQ"(OC;JK).
2617	13	AN<(GC;QB).	2618	13	DD&UB.
2619	13	UG"CS.	2620	13	CQ"HA.
2621	13	KF'.	2622	13	CL<(OU;(BC^DQ)).
2623	13	CL"(DP[DH)>AR.	2624	13	AN<(SJ;OA).
2625	13	QV;CN.	2626	13	SG"((AV;CK)!AZ).
2627	13	BF<GR!CK.	2628	13	AN<ME.
2629	13	QB"(FO&HF).	2630	13	JL"(SO!FU).
2631	13	KT<((FE@QQ)!CX).	2632	13	UV"(CO&CP).
2633	13	CZ"(GN;CK)>EG.	2634	13	NT"CT.
2635	13	BF"(BE;CM).	2636	13	CU&(FW"(BC^BF)).
2637	13	NF&(EB?(AE+GO)).	2638	13	GF"(BO&NU).
2639	13	CT<ZG.	2640	13	TB!BD;WZ.
2641	13	CL"II.	2642	13	NO"(BL&JX).
2643	11	FQ<RQ.	2644	12	WU"LD.
2645	12	NE"GZ>CT.	2646	12	CL"(GO&EV)>UE.
2647	12	CL"(AY&DH).	2648	12	CQ<(FL?(-1"AU)).
2649	12	JN;CK>AR.	2650	12	DP[CK"QL;BJ.
2651	12	CL<(NH;JT).	2652	12	GK[KJ"OC.
2653	12	CK<(DC[(SR;KI)).	2654	12	CT"PX.
2655	12	CL<(JC[JQ).	2656	12	EC;JQ.
2657	12	AY&JO"EZ.	2658	12	HI;PV.
2659	12	NZ!AP.	2660	12	AN<EL;QB.
2661	12	YD!DO.	2662	12	AN<SI.
2663	12	DG<UZ.	2664	12	CP"(JO;NE).
2665	12	CL<((QO"EY);KH).	2666	12	CU;DO;MM.
2667	12	CQ<(YL;QE).	2668	12	CO;(AA&NK)IGX.
2669	12	DI"VC.	2670	12	QS"QR.
2671	12	PZ"(EP&(AA&CF)).	2672	12	(ED"AN)>(BV&KF).
2673	12	CU&(JP"FQ).	2674	12	NF&XR.
2675	12	NF&SK.	2676	12	KI<(VP](AW"-1)).
2677	12	DG"(JK;AS)>BK.	2678	12	RF"RF.
2679	12	DD&(LQ"GR).	2680	12	QJ?(-1<WI).
2681	12	XK?(-1"(AO]NN)).	2682	12	FP"CF.
2683	12	CO&KV.	2684	12	NF&(GJ&IE).
2685	12	CU&(CL"HA).	2686	12	PQ"FQ.
2687	12	GF<(WW;FP).	2688	12	NN<(CO&JT).

2689	12	CQ<(FO&SM).	2690	12	CU&(CM@CW)!FU.
2691	12	(CO;KX);(BC&DO).	2692	12	FP"(BE&MM).
2693	12	(CL"FP)>(BH&BE).	2694	12	CK<QA.
2695	12	MY!AA.	2696	12	XT"MJ.
2697	12	CK<(AA&QY).	2698	12	FP<(NT>CT).
2699	12	QS"(EP&KZ).	2700	12	JZ'.
2701	12	CL"(JO;FQ).	2702	12	FS"((AE&GD);LR).
2703	12	(AT&JY)"(IG;EJ).	2704	12	FO&BD;QC.
2705	11	CU&(CL<(QT!CN)).	2706	11	BS'.
2707	11	FS"FS;GE.	2708	11	JQ<GX.
2709	11	KI"LA.	2710	11	FR?(CU&(DA&GZ)).
2711	11	(FS"FS);HQ.	2712	11	CU&(QQ;JO).
2713	11	SR;GF.	2714	11	KA&RS"MQ.
2715	11	QB<TH.	2716	7	JH'.
2717	11	DN"(ME;FQ).	2718	11	GJ&CP.
2719	11	CQ<QI.	2720	11	KY[(NS[(-1;FK)).
2721	11	JO&NE.	2722	11	NF&XB.
2723	11	CQ<(SD^UP).	2724	11	FP<(LZ;JO).
2725	11	JT"(EX&LJ).	2726	11	CQ"(JS;DB).
2727	11	AN<JP.	2728	6	AN<(GK[SE).
2729	11	DG<OD.	2730	11	OG"IH.
2731	11	FP"PB.	2732	11	FP"NQ.
2733	11	QC"XX.	2734	11	SG"((QO"EY);KH).
2735	11	NF&(FQ"AU).	2736	11	HB"(GJ&CN);GT.
2737	11	HB"(GJ&CN);FP.	2738	11	CQ"(DP[(DD;DD)).
2739	11	DG<ZX.	2740	11	FP"(MR;CP).
2741	11	FS"(CX&JR).	2742	11	KG&(Q"Q"WQ).
2743	11	PZ"WA.	2744	11	SY"(AT&AG).
2745	11	SG"(BC&FS).	2746	11	JT"XV.
2747	11	GF"(NK;FU).	2748	11	JQ<(CO&(GC;CK)).
2749	11	VA"GR.	2750	11	CQ"XY>CT.
2751	11	NE"NI>FT.	2752	11	OX'.
2753	11	WI"KP.	2754	11	FP"IZ.
2755	11	QS"OW.	2756	11	NO"(WT!AP).
2757	11	CL<(KK&QF).	2758	11	AN<(AE+CY).
2759	11	XN!(EP^BE).	2760	11	NE"(DU&(JO;FP)).
2761	11	AN<((AV&NM);FO).	2762	11	CU&(JT"JT).
2763	11	FP<(SE!AP).	2764	11	CU&(EP&KZ).
2765	11	DD&(BN[OM).	2766	11	(AY;BX);(BN[DO).
2767	11	EM^BA;KH.	2768	11	AS;JL"UE.
2769	11	CK<(GN;CK).	2770	11	SG"WB.
2771	11	ER?UY.	2772	11	CO&VF.
2773	11	CL<QU.	2774	10	QH"MQ.
2775	10	SD^UO.	2776	10	RS"FT;ER.
2777	10	FQ"(HH&(BD&FW)).	2778	10	CQ<(LI^EA).
2779	10	LY'.	2780	10	AN"(DP[CK]>QL.
2781	10	SJ;(AT&JY).	2782	10	FP"((CU;FO)ICX).
2783	10	GY"DO.	2784	10	JL"((JK;DB)IDQ).
2785	10	CK<SU.	2786	10	SR;EW.
2787	10	CU&(AN<CN).	2788	10	DN"((BM;FO)IAP).
2789	8	QN"IZ.	2790	10	NF&KV.
2791	10	GY"(HV!AA).	2792	10	SS"EE!DO.
2793	10	FP"((AY;NR)IKO).	2794	10	CL<UM!GF.
2795	10	CQ"XU.	2796	7	KI<(DP[(CU;IK)).

2797	10	KY[(TB&(BD&AU))].	2798	10	NT"FG>BK.
2799	10	SJ&SR.	2800	10	DC[(NS[(JO;KH))].
2801	10	FQ<(NS[(JO;KH))].	2802	10	CK<(CU&VA).
2803	10	DD&(BG@DJ;DD)).	2804	10	ZH'.
2805	10	FR?(ED"FS).	2806	10	NO"(BQ&BE).
2807	10	DG<(AU"CM).	2808	10	WP?HT.
2809	10	KT"VA.	2810	10	(CW;BD);(JO;FP).
2811	10	GF"(PL!CX).	2812	10	SY"GU.
2813	10	CQ<YM.	2814	10	CK<KO.
2815	10	NO"(QQ!FU).	2816	10	CL"ZI.
2817	10	DL"(AY&DF).	2818	10	ZV'.
2819	10	CU&WMIGG.	2820	10	HW"(AO]FO).
2821	10	CE@BX.	2822	10	CO&(AE+BR).
2823	8	QK[(-1;JQ).	2824	10	GK"FT&NP.
2825	10	NE"CN.	2826	10	JT"(BM&QB).
2827	10	CL"((JN;FO)!AP).	2828	10	FP"FI.
2829	10	CQ"(GJ&IE).	2830	10	CL<(OC;SE).
2831	10	JL"(BG@EA;CM)).	2832	7	CQ"(SI;GW).
2833	10	SG"KO>AU.	2834	10	JL;RD.
2835	10	NZ"DH.	2836	10	NO"XI.
2837	10	CL<(LI^II).	2838	10	CQ<(DD&SE).
2839	10	WU"(JO;FU).	2840	10	DG"QZ>GR.
2841	10	WS;NT.	2842	10	BN[BW.
2843	10	CU&(PZ"VA).	2844	10	FQ"PR.
2845	10	PZ"(GJ&OT).	2846	10	AN<(AQ[CK).
2847	10	FP"((QB"QB);CP).	2848	10	NO"RL.
2849	10	CK<HF.	2850	10	DN"((AV;CM)!AZ).
2851	9	CT<HL.	2852	9	CL"(AH&DV).
2853	9	KT"LD.	2854	9	JO"LL.
2855	9	AN<YA.	2856	9	CM@QT.
2857	9	DD"KN.	2858	9	CP"DY.
2859	9	CU&(CL<(QQ;JO)).	2860	9	CL<GX.
2861	9	PZ"UT.	2862	9	BF"UG.
2863	9	AN<HG.	2864	9	DG<(AN<CN).
2865	9	AN<(QT!CN).	2866	9	(KG;CY)&(JU;QB).
2867	9	KI'.	2868	9	CL"(DP[NV]>FY.
2869	9	DI<((AY;NR)!KO).	2870	9	DH"(BM!CM).
2871	9	NS[(-1;FK).	2872	9	CK<(DA;CK).
2873	9	CU&(JL"AR).	2874	9	BF<(DO&MM).
2875	9	SR&XJ.	2876	9	(JS!BD)&(DG&FQ).
2877	9	FQ<OQ.	2878	9	FP"(HQ;JK).
2879	9	GF"(GL[CD).	2880	9	CR&(NM;FO).
2881	9	GF"NV.	2882	9	CK<NV.
2883	9	DL"BE.	2884	9	CP<(KY[KF).
2885	9	NU'.	2886	9	BY@GB.
2887	9	WU"(JS;DB).	2888	9	FP"SK.
2889	9	FP<(SE!GG).	2890	9	CU&((JN;FP)"GB).
2891	9	NN"(BM!CM).	2892	9	CU;CO!BT.
2893	9	CL<(JU&(AO]NO)).	2894	9	FQ<UF.
2895	9	SG"UZ.	2896	9	CK<(DD&OA).
2897	9	AN<AP.	2898	9	BO;FC"FT!GG.
2899	9	FP"(EO&FQ).	2900	9	FS<ML.
2901	9	CP"CK;FU.	2902	9	NN"CV.
2903	9	ZO"FY;SG.	2904	9	CQ<RC.

2905	9	AN<(DD&SE).	2906	9	NN"((AY;IO)!AP).
2907	9	CK<CN.	2908	9	FR2(DJ&NX).
2909	8	DD&VQ.	2910	9	BQ&BE"UE.
2911	9	YH'.	2912	9	CP<OX.
2913	9	FO&(CO&CP).	2914	9	CU&(CT"(CR;AD)).
2915	9	DD&(JZ\$(AA;CP)).	2916	9	CU&((CZ"PI)>FT).
2917	9	NE"VT.	2918	9	EC;CP.
2919	9	FS<UY.	2920	9	IB'.
2921	9	ED"((DO;DG)!EZ).	2922	7	PZ"KQ.
2923	8	CU&(CL"KP).	2924	8	KI<VG.
2925	8	SU;QC.	2926	8	AN<VG.
2927	8	CK<QT.	2928	8	FQ"(FX!AA).
2929	8	SU;OB.	2930	8	DG<((AP;CU);QB).
2931	8	DI"(FX!AA).	2932	8	BY@AZ.
2933	8	CU&((GO&EV)"UE).	2934	8	CP"((FO;JU)!BA).
2935	8	EC"KN.	2936	8	TT;(JZ+AH).
2937	8	CL"JQ>HA.	2938	8	KH'.
2939	8	NF&(AN<GU).	2940	8	HJ]GX.
2941	8	CZ"(CY&CN).	2942	8	CX'.
2943	7	JQ<SF.	2944	8	OJ"(CO&AS).
2945	8	FP"SN.	2946	8	SG"(AV&KE).
2947	8	DP[(CZ<HR).	2948	8	FR?(ED"GF).
2949	8	JL;BI.	2950	8	AN<ZL.
2951	8	GF"(DA;CK).	2952	8	CQ<((QO"TN);QE).
2953	8	CL"QD.	2954	8	(CO&OC);(BC^DQ).
2955	8	GU'.	2956	8	JP;QL.
2957	8	CQ"(DT;CK).	2958	8	CQ"MH.
2959	8	OM'.	2960	8	FP"(CR&(NM;FO)).
2961	8	AN<VU.	2962	8	DG"RK>RK.
2963	8	DG<VA.	2964	8	(JO;FP)"(CW;CW).
2965	8	CL"(BD&QC).	2966	8	KY[(MS&(BC&FQ)).
2967	8	SG"MA.	2968	8	JV"AU.
2969	8	CP"EH.	2970	8	SR;JT.
2971	8	PZ"XF.	2972	8	AN<TD.
2973	8	YI?(-1<OC).	2974	8	CM@AW.
2975	8	(CO&KX)&(BC&UG).	2976	8	CO&(HB"RP).
2977	8	DL"(BE&NO).	2978	8	DD"XT.
2979	8	NO"VA>GR.	2980	8	(DN"QX)>(BJ&GI).
2981	8	CK<(NK;GP).	2982	8	CP<WA.
2983	8	EU"PE>CT;OP.	2984	8	ED"QD.
2985	8	(RI;DQ)"(DQ;UE).	2986	8	CL<YB.
2987	8	DL"NN>DL.	2988	8	CL"(BM!CM).
2989	8	FS"((JN;FO)!AP).	2990	8	NO"KW.
2991	8	QS"(AO+(AB"-1)).	2992	8	GF"(AO+(AB"-1)).
2993	8	NE<(JG;JG).	2994	8	UR?(-1"AS).
2995	8	SV"(AT&AU).	2996	8	DG<(FP;KR).
2997	8	SG"XA.	2998	8	WI"SE.
2999	8	DG<(EO&FQ).	3000	8	DK'.
3001	8	KS'.	3002	8	(CU;FU)!(FU"FU)).
3003	8	OO]QC.	3004	8	JT"(AC]GA).
3005	8	NN<(FR?QR).	3006	8	KG&YS.
3007	7	MZ'.	3008	8	WS'.
3009	8	JT"EI.	3010	8	CK<(PS;FP).
3011	8	PZ"(BL&JX).	3012	8	NO"QA.

3013 8 DD"QA.  
 3015 8 AN<(CX&JR).  
 3017 8 CK<(IG;FQ).  
 3019 8 XF"CT.  
 3021 8 RY'.  
 3023 8 JO;IK.  
 3025 8 CO&(CW"BW).  
 3027 8 FQ"(CO&(CW"BW)).  
 3029 8 QC"((DO;DG)IFZ).  
 3031 8 AN<(DC[(ID;JX)).  
 3033 7 QL"NE>QL.  
 3035 7 UC'.  
 3037 7 JS;AX!GG.  
 3039 7 DP[HQ.  
 3041 7 CU&((GO&EV)"UE).  
 3043 7 FO<(FO&(PC^LJ)).  
 3045 7 CP"(LQ;FP).  
 3047 7 KN"FT!FU.  
 3049 7 DG<GX.  
 3051 7 QT'.  
 3053 7 CL<UM!KH.  
 3055 7 PZ"(HH&(BD&DH)).  
 3057 7 BG@ (EA;CM)"DQ.  
 3059 7 CL"HU.  
 3061 7 FR?PQ.  
 3063 7 SG"(NK;FP).  
 3065 7 CU&RA.  
 3067 7 NF&(DC[WA).  
 3069 7 KI<(NN;(CW"GI)).  
 3071 7 DG<ZM.  
 3073 7 UG"(NS[(JO;KH)).  
 3075 7 NE"XB.  
 3077 7 DI"(CC[GA).  
 3079 7 BD&(JA?CN).  
 3081 7 DN"(DC[(ID;LJ)).  
 3083 7 WD"WZ.  
 3085 7 GF"(NU;DE)>FY.  
 3087 7 UG"(CX&JR).  
 3089 7 SG"MC.  
 3091 7 OZ^JQ.  
 3093 7 GO"IF.  
 3095 7 FQ"(FP;RD).  
 3097 7 CQ"(OY!BC).  
 3099 7 KI<(EO&FQ).  
 3101 7 CQ"GB>GR.  
 3103 7 HA;JQ.  
 3105 7 UG"ES.  
 3107 7 PZ"KC.  
 3109 7 (GU;GU)IKH.  
 3111 7 CQ<PO.  
 3113 7 CL<UA.  
 3115 7 (DN"ZF)>GU.  
 3117 7 FR?(CK;(AE+CY)).  
 3119 7 OC;SE>GU.

3014 8 QB"(BE;CK).  
 3016 8 CK&GE.  
 3018 8 DI<(BY@ (FO;CP)).  
 3020 8 CK<WB.  
 3022 8 DN"(GN;CK).  
 3024 8 CU&((DP[JT)"CN).  
 3026 8 CQ"TC.  
 3028 8 NF;FF.  
 3030 8 CU&(NE"(FO;KH)).  
 3032 7 CU&(RS"FT).  
 3034 7 HW"ZA.  
 3036 7 JK"VU.  
 3038 7 FQ"FQ>WZ.  
 3040 7 GO&EV"UE.  
 3042 7 FP"BS.  
 3044 7 PZ"((CU;FO)ICX).  
 3046 7 CP"(JC[(-1&JQ)).  
 3048 7 JQ<ST.  
 3050 7 GX!FU.  
 3052 7 CQ<(RB[(-1;DD)).  
 3054 7 CL<(KK;QF).  
 3056 7 KI"(HR;FP).  
 3058 7 CK"SF>CT.  
 3060 7 CL<ZD.  
 3062 7 CQ"(FO;DO).  
 3064 7 FQ"AU.  
 3066 4 BN[QD.  
 3068 7 1C!FU.  
 3070 7 CL<(WW;FP).  
 3072 7 FS<ZM.  
 3074 7 AN<RG.  
 3076 7 CQ"(SD^(DA;CM)).  
 3078 7 PZ"(IL[(-1&BW)).  
 3080 7 ZM!NV.  
 3082 7 DI"LT.  
 3084 7 FV](DG;AA)!FU.  
 3086 7 CU&(PP"(HX;FO)).  
 3088 7 CU&(GQ"AR).  
 3090 7 CM@ (OZ^BW).  
 3092 7 BF"(MR;CP).  
 3094 7 DD"IF.  
 3096 7 CL"(CR;CK).  
 3098 7 RW"BK.  
 3100 7 DG<ZC.  
 3102 7 QE'.  
 3104 7 CP"DG;NE.  
 3106 7 DH<(SX]FO).  
 3108 7 CL"(BJ;CK).  
 3110 7 CU&(QS"(SE!GG)).  
 3112 7 SG"ZD.  
 3114 7 NA;FZ.  
 3116 7 SI"FT.  
 3118 7 FP<(BN[(UQ"CN)).  
 3120 7 FP<(FR?NZ).

3121	7	SD^UG.
3123	7	NJ!CU!CM"CT.
3125	7	DC[(GS!GG).
3127	7	CT"GV.
3129	7	AY;IO!AP.
3131	7	HX&FQ"FT.
3133	7	GC;CJ"FT!GG.
3135	7	DG<PR.
3137	7	RO"NP.
3139	7	KI"QE.
3141	7	FS<(CU&LE).
3143	7	MY!AA.
3145	7	CL<(FW"(BC^BF)).
3147	7	DG<UY.
3149	7	CU&(CW"BW).
3151	6	ED"QB.
3153	6	((DP[CK)"QL);MK.
3155	6	YG;(EP&GW).
3157	6	SD^FU.
3159	6	PZ<(FR?NN).
3161	6	CQ"JY.
3163	6	CQ<PA.
3165	6	KY[QF.
3167	6	NF&UG.
3169	6	CL"(GJ&NU).
3171	6	JQ<OX.
3173	6	CL"(CO&AS).
3175	6	CL<WE.
3177	6	DN<(SJ;OA).
3179	6	CL<(SD^UP).
3181	6	NF&(VV"SE).
3183	6	CL<(NW;QF).
3185	6	HW<YM.
3187	6	AN<(CR;BL).
3189	6	DG<(JU&(NE"SE)).
3191	6	FS;ER.
3193	6	CR;CK.
3195	6	MW'.
3197	6	CR&(NM;FO).
3199	6	CU&JR.
3201	6	VC"GU.
3203	6	OD"AU.
3205	6	DG<(AY&BI).
3207	6	PZ"(AT&JY).
3209	6	CW"GI;FP.
3211	6	CQ<(YL;QE).
3213	6	QO"TN;SG.
3215	6	CL<((AA&DU)IDE).
3217	6	DD&QF.
3219	6	AN<(AU"CM).
3221	6	PZ<(FR?(LM;LF)).
3223	6	CP"XV.
3225	6	CK<MA.
3227	6	SD^FP.

3122	7	(JN;FO)"(BJ;CK).
3124	7	CQ<((AY;NR)!KO).
3126	7	JU&SF.
3128	7	QH"(UO;FP).
3130	7	CL<KD.
3132	7	FR?VA.
3134	7	CL<NT.
3136	7	DN"(BE;CK).
3138	7	FP"KV.
3140	7	DG<(CR;AD).
3142	7	DI<WB.
3144	7	FO"FS.
3146	7	UY'.
3148	7	ZS;((TV;AS)"DQ).
3150	7	DP[JT"CN!GF.
3152	6	NE<(DD&(FQ"FQ)).
3154	6	FS"JK.
3156	6	DI"LA.
3158	6	CU&(GP!ER).
3160	6	NO"(BD&(FO;HD)).
3162	6	QT;FW"FT.
3164	6	NE"(QT!CN).
3166	6	HV!AA"CT.
3168	6	CC[(AP&JQ).
3170	6	DH"(BM!CM).
3172	6	CL<BT.
3174	6	FP<UL.
3176	6	CQ"((CR;AD)!FU).
3178	6	NN<(SJ;OA).
3180	6	JL"(DO&MM).
3182	6	(LK"FT);(BN[IM).
3184	6	SV"(LZ;JO).
3186	6	AN<SQ.
3188	6	DG<(WU!FO).
3190	6	CQ<ZM.
3192	6	DP[(CZ<UW).
3194	6	SG"JF.
3196	6	CL<VR.
3198	6	WU"(AA&NE).
3200	6	CK<(CO&(DA;CK)).
3202	6	EP&OM.
3204	6	CU&VQ.
3206	6	FS<(JP"FQ).
3208	6	(JK;AS)"MFIKR.
3210	6	KI"(SE!GG).
3212	6	QB"(GU;GU).
3214	6	AN<((AA&ON);ON).
3216	6	FS<SK.
3218	6	AT&AG.
3220	6	AN<(EO&FQ).
3222	4	NJ;AZ.
3224	6	FO<VB.
3226	6	SJ&(EO&FQ).
3228	6	SG"QL.

3229	6	CL<(FP;KR).	3230	6	KC'.
3231	6	PZ"(BJ;CK).	3232	4	OI;BI.
3233	6	KI"(BM;CM).	3234	6	FP"((JN;FO)!AP).
3235	6	QB<SL.	3236	6	KL'.
3237	6	CK<UA.	3238	6	CT"(DJ&NX)!DO.
3239	6	CQ"((EI"EI);NV).	3240	6	CQ<GO.
3241	6	EQ!AA.	3242	6	KT"(JN;FP)>QE.
3243	5	QV!CK.	3244	6	DH"(JN&QD).
3245	6	RK"FT.	3246	6	KT"DQ.
3247	6	JT"(WT!AP).	3248	6	JQ<(OH;(CW"GI)).
3249	6	UV"(LS;FP).	3250	6	FP"QL.
3251	6	CL"(GC;QB).	3252	6	CU&(CL"(UO;FP)).
3253	6	CL<(CR&(HY[DG])).	3254	6	DC[(SK"GB).
3255	6	RI"NP.	3256	6	CQ"(HX&FQ)>FT.
3257	6	UG"WO.	3258	6	SG"VJ.
3259	6	CK<((CM@CX)!FU).	3260	4	OC;JN.
3261	6	CQ<(CH"BK).	3262	6	CQ"MA.
3263	6	CQ"MA.	3264	6	QC>AI.
3265	6	(CK"NE)>(AO+AB).	3266	6	GJ&NU.
3267	6	SG"ZY.	3268	6	QQ"KV.
3269	6	CK<(CM@CX).	3270	6	YS"(BY@FO;CP)).
3271	6	TH"WZ.	3272	6	KG&(CL<OM).
3273	6	VT'.	3274	6	NS[(-1&RL).
3275	6	ZZ'.	3276	6	IC"((BO;MP);NX).
3277	6	DD<QU.	3278	6	BL&JX.
3279	5	AY&(AN<RZ)!FZ.	3280	5	DG;AY;NR>CT.
3281	5	CL<(HH&(BD&FW)).	3282	5	AN<(HH&(BD&FW)).
3283	5	CU&(DC[SR).	3284	5	JQ<(GS&RH).
3285	5	NO"(CV;KH).	3286	5	DC[(SR;NN).
3287	5	JQ<(CU&JO).	3288	5	(CU&FO);(EP;FO).
3289	5	CL"BW.	3290	5	DI"FW.
3291	5	PA'.	3292	5	BE;CM!FU.
3293	5	KK&QF>CT.	3294	5	DD<(KK&QF).
3295	5	(CL<DW)"(FT;FP).	3296	5	CL<(SW!BH).
3297	5	KI<TP.	3298	5	AV&CK;AZ.
3299	5	(CU&VF)!(CK;IJ).	3300	5	ED<(QZ"(BJ&QB)).
3301	5	CK<BJ.	3302	5	CL<OX.
3303	5	NO"(SI!DO).	3304	5	QS"(DC[(ID;CM)).
3305	5	CU&(FQ<(OZ;LJ)).	3306	5	CL<(AV&KE).
3307	5	NO<(EB?(AE+CY)).	3308	5	CK<UL.
3309	5	SG"(EQ!AA).	3310	5	TB!BD!AU.
3311	5	NE<((QO"TN);QE).	3312	5	NO<(PE"CT).
3313	5	AN<(JL"AR).	3314	5	KY[(JL>AR).
3315	5	DI<(BN[(VN!GO)).	3316	5	FS<(JL"AR).
3317	5	CL<((LZ;SG)>AR).	3318	5	CL<(NS[(JO;KH)).
3319	5	FR?(JU&(NE"SE)).	3320	5	ZM!NT.
3321	5	NK!MS!AP.	3322	5	CU&(AO!DG).
3323	5	VK?(-1"(DT;CK)).	3324	5	KK;GH.
3325	5	FP"(CO&LF).	3326	5	CQ<NV.
3327	5	DI<GR.	3328	5	NN"(DC[(ID;LJ)).
3329	5	SG"(FO;HQ).	3330	5	BY&FS.
3331	5	FP<(BY&FS).	3332	5	JQ<(BY&FS).
3333	5	OD'.	3334	5	SY"(BC&OC).
3335	5	FS<(NS[(-1&AZ)).	3336	5	JL"CK.



3337	5	JL<YO.	3338	5	DN<(JK;FS).
3339	5	CL<(JK;FS).	3340	5	PZ"(VP](AW"-1)).
3341	5	DX"AS;JO!NV.	3342	5	FR?(AU"CM).
3343	5	NO"(OY!BC).	3344	5	NH;QB.
3345	5	DD<MA.	3346	5	JK"NQ.
3347	5	DJ&(FQ"AR)!GG.	3348	5	CL<(SD^FO).
3349	5	FQ<(EB?NP).	3350	5	QX'.
3351	5	BN[(PQ"GR).	3352	5	FS"(AA&JI).
3353	5	SG"(AO]BF).	3354	5	DD"(BE&MM).
3355	5	XJ"SK.	3356	5	FR?(AT&AG).
3357	5	CL<JN.	3358	5	UV"JL>GF.
3359	5	UV<(FR?(NH;NB)).	3360	5	CQ"(CR&VV).
3361	5	CU&((OY!AA);NR).	3362	5	NO"(GC;FQ).
3363	5	DN<JV.	3364	5	(HX;FO)"WZ.
3365	5	FO"FP>GB.	3366	5	HX;FO.
3367	5	AN<(OY!BC).	3368	5	PZ"(HQ;JK).
3369	5	WY^(JL;FO).	3370	5	CZ"EG.
3371	5	PY'.	3372	5	CK<(CO&PB).
3373	5	QC"EH.	3374	5	CL"(AO](CE@BX)).
3375	5	KG&NI.	3376	5	FP"AI.
3377	5	NO"KC.	3378	5	FP<ML.
3379	5	QC"(DP[(CU;IK)).	3380	5	KY[(BC^DQ).
3381	5	QB"(CO&BT).	3382	5	FP<SE.
3383	5	FM'.	3384	5	BX&FP"AR.
3385	5	DG<(SY"FQ).	3386	5	AY;NR!KO"UE.
3387	5	FS<((BD;AZ)&FP).	3388	5	PO'.
3389	5	CO&ZM.	3390	5	FA;(NO"NO).
3391	5	BJ;CM"CT.	3392	5	PD'.
3393	5	FV]AP.	3394	5	DR"FT.
3395	5	WO'.	3396	4	WI>CT.
3397	5	(RI"DQ);(CO&JT).	3398	5	KI"(QK[(-1&DE)).
3399	5	HP@CW.	3400	5	CL<(CO&JT).
3401	5	CQ<WO.	3402	5	WU"JL.
3403	5	CU&(DR"(AA&NE)).	3404	5	CT"((DJ;BC)IKH).
3405	5	GC;CJ"FT;YP.	3406	5	XT"FY.
3407	5	CU&(OG"VF).	3408	5	EN](BB&QB).
3409	5	CQ<TF.	3410	5	PZ"XH.
3411	5	NF&(IL[(BH&PZ)).	3412	5	BY@((FO;CP)>CT.
3413	4	DG<ZP.	3414	5	HW"LE.
3415	5	QB"QB;CP"WZ.	3416	5	TB&(BD&MK).
3417	5	AA&AZ.	3418	5	HF'.
3419	5	SD^VT.	3420	5	CU&VT.
3421	5	QF"(CO&(CW"BW)).	3422	5	VF!FU.
3423	5	CL<(CR&(FQ>AR)).	3424	5	CZ"RW>BK.
3425	5	WV!BH.	3426	5	GF"(FO;JN).
3427	4	CU&GE.	3428	4	SG"MQ.
3429	4	NF&(SK"KP).	3430	4	GF"(JN;CK).
3431	4	DC[HQ.	3432	4	RS>FT.
3433	4	QB"(AE+DZ).	3434	4	QH"BQ.
3435	4	LV!AM.	3436	4	SJ&((DP[CK)"QL).
3437	4	DG<((DP[CK)>QL).	3438	4	RS"FT;JQ.
3439	4	LV!AF.	3440	4	AN<BS.
3441	4	CL<(FO&(PC^LJ)).	3442	4	FG&(PC^LJ).
3443	4	DC[(SR;DF).	3444	4	CL"MT.

3445 4 LS'.  
 3447 4 CL<(CU&WC).  
 3449 4 SG"(CV;KH).  
 3451 4 DN<(SD^HO).  
 3453 4 SU;OC.  
 3455 4 (YG!AA)!(BH&KI).  
 3457 4 FP<UT.  
 3459 4 XK?(-1<HG).  
 3461 4 HW'.  
 3463 4 HJ](-1&(GF;GF)).  
 3465 4 NE"((HH&BD);DH).  
 3467 3 ZL!BDIKO.  
 3469 4 DI<SF.  
 3471 3 OT<((FO;SJ)IHC).  
 3473 4 (DT;CK)"(JB;IX).  
 3475 4 JL;BI"UE.  
 3477 4 SG"XU.  
 3479 4 SJ;NUIAZ.  
 3481 4 CU&(NZ"QL)ICV.  
 3483 4 CL<YY.  
 3485 4 SG"((DU;MP)IRJ).  
 3487 4 KT<((QO^EY)IKH).  
 3489 4 ES"PE>CT.  
 3491 4 UG"1D.  
 3493 4 CU&-(CL"AN)>JN).  
 3495 4 KI<(WW;FP).  
 3497 4 WU<(FR?QC).  
 3499 4 YM"FT.  
 3501 4 HO;CK.  
 3503 4 CL<(1C;FP).  
 3505 4 CR;KJ.  
 3507 4 KT"XB.  
 3509 4 SG"(DA;CK).  
 3511 4 FP"TI>FT.  
 3513 4 FS<OM.  
 3515 4 DE&GT.  
 3517 4 KI<(JV;KH).  
 3519 4 JQ"TI>FT.  
 3521 4 DC[(JS;DR)"CT).  
 3523 4 FO<(DC[XR).  
 3525 4 FP<VU.  
 3527 4 FO&OQ.  
 3529 4 WU"(JK;AS)>BK.  
 3531 4 FPIGG.  
 3533 4 NE"NQ.  
 3535 4 KF<XX.  
 3537 4 SV"(GU;GU).  
 3539 4 QC'.  
 3541 4 JN"(BE&MM).  
 3543 4 GF"(BG@DG).  
 3545 4 DN<(MR;CP).  
 3547 4 DN<(SEIGG).  
 3549 4 NS[(-1&HO).  
 3551 4 AS"UE.

3446 4 CU&((FO!JU)!BA).  
 3448 4 JQ<(CU&WC).  
 3450 4 GJ&QE.  
 3452 4 KI"JV.  
 3454 4 DH<(QQ;JO).  
 3456 4 AN"FW>FT.  
 3458 4 AN<(LI^EA).  
 3460 4 GJ&CV.  
 3462 4 CT<QW.  
 3464 4 SG"(SI;JO).  
 3466 4 FR?(AF+HG).  
 3468 4 SG"(CO&JM).  
 3470 4 DN<(BG@GA).  
 3472 4 (AV&KE)>AR.  
 3474 4 FP<YD.  
 3476 4 JQ<(JN&QD).  
 3478 4 RK"HK.  
 3480 4 BY&TL.  
 3482 4 ED<YY.  
 3484 4 QL"QZ.  
 3486 4 CL<(QZ"(BJ&QB)).  
 3488 4 FP<((QO"TN);QE).  
 3490 4 DN<(JU&FW).  
 3492 4 WU"QD.  
 3494 4 SJ&(BN[(VN;GO)).  
 3496 4 CQ<XW.  
 3498 4 SG<(DC[WA).  
 3500 4 FS<SR.  
 3502 4 OK"(CR;BL).  
 3504 4 NE"(CR&KJ).  
 3506 4 FQ<ZM.  
 3508 4 CR;CK"WZ.  
 3510 4 JF'.  
 3512 4 DC[(ID!BC).  
 3514 4 AN<(CO&LF).  
 3516 4 JQ<(JV;KH).  
 3518 4 VC>AU.  
 3520 4 AN<(AY&BI).  
 3522 4 1H'.  
 3524 4 (CL"PZ)>(AT&AP).  
 3526 4 CG@JK;FS).  
 3528 4 CK<(VP)[AW"-1)).  
 3530 4 OY!BC.  
 3532 4 FP"PJ>BA.  
 3534 4 SG"NQ.  
 3536 3 DU;JO!FP>AR.  
 3538 4 CU&(SA[(CD]GG)).  
 3540 4 NE"(CK;FQ).  
 3542 4 CL<(VM!JQ).  
 3544 4 KG&(HY[(-1&CK)).  
 3546 4 KI"BR>BJ.  
 3548 4 DD<(EO&FQ).  
 3550 4 AN<(GC&FQ).  
 3552 4 SM;CP.

3553	4	CL<(FP;(BC&LJ)).	3554	4	BQ&CF.
3555	4	FS"(JL;EM)..	3556	4	SG"(JL;EM).
3557	4	CL<(EB?(AE+GO)).	3558	4	SG"ZV.
3559	4	DN<(FO;JW).	3560	4	FQ<(FO;JW).
3561	4	FP;CK.	3562	4	FW"(AT&LY).
3563	4	FP<(CC[(AA&GE)).	3564	4	CL<XC.
3565	4	GB"GB;QB.	3566	4	YJ^JT.
3567	4	KG&KC.	3568	4	FQ<CN.
3569	4	SJ;(CL"(BM;CK)).	3570	4	JQ<(IL[(BH&PZ)).
3571	4	AY;NR!KO"IH.	3572	4	DH<((JN;FO)!AP).
3573	4	NF;BB.	3574	4	IY'.
3575	4	CQ<(OC;SE).	3576	4	SG"SE.
3577	4	NF;EX;NX.	3578	4	DN"IZ.
3579	4	ED"(FO;IB).	3580	4	ZK"(AO]DG).
3581	4	(LI^FO);(NO"NO)).	3582	3	FP<(AO+(AB"-1)).
3583	4	GF<(GK[OC).	3584	4	DG<LT.
3585	4	JW"(JO;AU).	3586	4	FO<(JU&SF).
3587	4	PZ"SE.	3588	4	NO"((AV;CM)!AZ).
3589	4	EQ'.	3590	4	QC"EQ.
3591	4	NO<(SJ;OA).	3592	4	KI<(BY@DH).
3593	4	QB<(FV]AP).	3594	2	KG&(DO&YP).
3595	4	WS'.	3596	4	NE"QQ.
3597	4	CK<XG.	3598	4	FP<XG.
3599	4	OJ"(CR;(HY[DG)).	3600	4	AN<(BE&KF).
3601	4	VK?(-1"(RM;BA)).	3602	4	QS"JL.
3603	4	DD;DD;JT.	3604	4	SV<(FR?(AV&GH)).
3605	4	SJ;(PZ"VA).	3606	4	DN<((FE^QQ)!CX).
3607	4	QC"(AF+HG).	3608	4	UG"(JU&SS).
3609	4	PZ"VA.	3610	4	SG"KV.
3611	4	AV&QS"GP.	3612	4	ZP'.
3613	4	HY'.	3614	4	DC[(((AN<SE);FQ).
3615	4	DG<((QB"QB);CP).	3616	4	CL<(DP[NI)..
3617	4	CO&(CW"BW)>AR.	3618	4	FS<HO.
3619	4	HF"AR.	3620	4	CL<HO.
3621	4	FP<FS.	3622	4	FR?FF.
3623	4	DC[(RM!BC).	3624	4	SG"MK.
3625	4	AQ[FQ"CT.	3626	4	CO&(TC+AB).
3627	4	CP"(GJ&(EH[BA)).	3628	3	JK;DH.
3629	3	NF&(CL<JK).	3630	3	(JS;BD);(AE+BR).
3631	3	CU&(AN<(JN;CK)).	3632	3	RN"(AO+(AB"-1)).
3633	3	QL"PM>QL.	3634	3	BE&(EP;JO).
3635	3	SG"(HH&(BD&FW)).	3636	3	CT<(HQ;DO).
3637	3	DP[CK"QL.	3638	3	XP?.
3639	3	CZ<SU.	3640	3	NF&VG.
3641	3	CQ<(BE;ER).	3642	3	FXIAA.
3643	3	CK<VG.	3644	3	DI<VG.
3645	3	DC[(SR;DF).	3646	3	KY[SR.
3647	3	NN<((CU;FO)!CX).	3648	3	HW"(BJ;BA).
3649	3	FS"FT.	3650	3	CL"LK.
3651	3	SG"((FO;JU)!BA).	3652	3	FP<(CU&WC).
3653	3	DC[(SR;SU).	3654	3	IB&TC.
3655	3	BD&(FO;HD).	3656	3	YG;CX.
3657	3	CU;GX!FP.	3658	3	FP"FW.
3659	3	CL<(JN;CK).	3660	3	QC"(GA;JO).

3661 3 CK<BJ.  
 3663 3 XO'.  
 3665 3 FP<(SI;JO).  
 3667 3 CL<IN.  
 3669 3 FQ<(OZ^LJ).  
 3671 3 SD^(SW!BH).  
 3673 3 KT<(FR?NL).  
 3675 3 FP<YY.  
 3677 3 ZL;NE.  
 3679 3 SD^UP.  
 3681 3 AN<1D.  
 3683 3 BF<((AY;NR)!JL).  
 3685 3 QH"(DA;CK);WZ.  
 3687 3 1C;SG.  
 3689 3 FS<ZM.  
 3691 3 CP<(KX;KS).  
 3693 3 NN<QM.  
 3695 3 NO"UI.  
 3697 3 ZU"QE.  
 3699 3 DD&(DI<GR).  
 3701 3 DI<(EP&(AA&CF)).  
 3703 3 JL'.  
 3705 3 SD^(JV;KH).  
 3707 3 CK<XQ.  
 3709 3 (CK&BZ)"(NS[BI).  
 3711 3 SG"VQ.  
 3713 3 AP;ER.  
 3715 3 KI<XR.  
 3717 3 FO&OQ.  
 3719 3 CL<HM.  
 3721 3 CU&(OY!BC).  
 3723 3 CY;CK"UE.  
 3725 3 JO;IA>AR.  
 3727 3 KG&QR.  
 3729 3 KY[EZ.  
 3731 3 FS"XF.  
 3733 3 FR?((AA&DU);DE).  
 3735 3 CU&RG.  
 3737 3 FQ"MC;GF.  
 3739 3 AV&QS.  
 3741 3 FP<WD.  
 3743 3 AN<XV.  
 3745 3 1J'.  
 3747 3 AN<SS.  
 3749 3 JZ\$AB.  
 3751 3 UV"(AN"AS).  
 3753 3 JT"(HV!AA).  
 3755 3 SD^MA.  
 3757 3 RK"FT;NO.  
 3759 3 CQ<(DP[(CU;IK)).  
 3761 3 NH;DO"MJ.  
 3763 3 CL"DL>SL.  
 3765 3 SG"(GJ&IE).  
 3767 3 SG"UF.

3662 3 CQ<ZD.  
 3664 3 CU&QF.  
 3666 3 KI<(KK^QF).  
 3668 3 VT"(GJ&NU).  
 3670 3 DN<(DT;CK).  
 3672 3 SV"IN.  
 3674 3 FQ<(EN](BB&QB)).  
 3676 3 FQ<(NW;QV).  
 3678 3 CL<(ZL;NE).  
 3680 3 FS"RA.  
 3682 3 AN<XW.  
 3684 3 NS[(JO;KH)"UE.  
 3686 3 1C!DD.  
 3688 3 CQ<(CR&KJ).  
 3690 3 QC>AI.  
 3692 3 FQ"DE.  
 3694 3 NT"GF.  
 3696 3 FS<VU.  
 3698 3 CQ<(HQ;JK).  
 3700 3 CK<(GO&FQ).  
 3702 3 AQ[GF!KH.  
 3704 3 ZY>JL.  
 3706 3 CK<OD.  
 3708 3 CL<(JS&(BD&QG)).  
 3710 3 JK<QR.  
 3712 3 CZ<NR.  
 3714 3 SV"(FO;HQ).  
 3716 3 DN<OQ.  
 3718 3 CP<TX.  
 3720 3 FP<(CK&NT).  
 3722 3 CP<(CO&QG).  
 3724 3 JQ<(MR;IJ).  
 3726 3 CU&NQ.  
 3728 3 FS"EZ.  
 3730 3 CQ<UP.  
 3732 3 CT<IS.  
 3734 3 UG"(AO]DG).  
 3736 3 PZ"HN.  
 3738 3 NE"(DG&NT).  
 3740 3 NO<((BF"MC);FP).  
 3742 3 KT<(HY[(-1&CK)).  
 3744 3 NO"FP>GB.  
 3746 3 NQ"AU.  
 3748 3 CK<(NS[(-1&KA)).  
 3750 3 FO"(AO]DG)!GG.  
 3752 3 (CL"FW)>(AT&LY).  
 3754 3 GF<KC.  
 3756 3 JQ<(AE+DZ).  
 3758 3 SG>AR.  
 3760 3 QC"GB.  
 3762 3 QB<QV.  
 3764 3 ED"(GJ&IE).  
 3766 2 HB"CP.  
 3768 3 CQ"((CU;BC);FP).

3769	3	GX!DD.
3771	3	CO&QV.
3773	3	CL<(JS;CV).
3775	3	CK<(GL[(AS;FO)).
3777	3	ML>AR.
3779	3	QB<((CY;JU)!QB).
3781	3	PZ"((AV;CM)!AZ).
3783	3	SV"(AE+CY).
3785	3	CU&HZ.
3787	3	CU;CO;QU.
3789	3	CK<(UO;FP).
3791	3	DI<ES.
3793	3	DN<((AY;IO)!AP).
3795	3	OY!AA;NR.
3797	3	CK<(BE&MM).
3799	3	FS<(EO&QB).
3801	3	CQ<(BN[BW).
3803	3	XQ"(JN;FO).
3805	3	PZ"(BE;CM).
3807	3	PT'.
3809	3	NO"(FO&HF).
3811	3	NO" LH.
3813	3	FS" LH>CT.
3815	3	CL<OX.
3817	3	EP&KZ.
3819	3	NO<(EB?(AE+GO)).
3821	3	AJ<(DF;FQ)>AI.
3823	3	OZ^RA.
3825	3	SY"(BC&HT).
3827	3	DN<(CO&(CW"BW)).
3829	3	CO&(CW"BW).
3831	3	FS"(GJ&(EH[BA)).
3833	3	FO<(AO]BF).
3835	3	QH"((BL;JX)!AU).
3837	2	NF&GE.
3839	1	OT"KU.
3841	2	SG"JK.
3843	2	QH"KP.
3845	2	CU&LD.
3847	2	QH"(AO+(AB"-1)).
3849	2	RS"FT;OV.
3851	2	CK<(JO&OF).
3853	2	WU"(NH;JT).
3855	2	FO&LO.
3857	2	CK"CQ>JK.
3859	2	CK<(FX!AA).
3861	2	KP"LD.
3863	2	FP<(FQ"FQ).
3865	1	JO<HQ.
3867	2	DP[CK"QL;BJ.
3869	2	CL<(QT!CN).
3871	2	CQ<MT.
3873	2	FO<LK.
3875	2	WP?(-1<LK).

3770	3	SD^(WT!AP).
3772	3	NE"((BM;FO)!AP).
3774	3	QS"(JS;CV).
3776	3	EP&SF.
3778	3	VW'.
3780	3	QD"IC!DO.
3782	3	FP"(BC&FS).
3784	3	DR<(SJ;OA).
3786	3	SD^FS.
3788	3	OO]CK.
3790	3	DN<((AV&NM)!FO).
3792	3	DD&SE.
3794	3	(CK&KJ)"(AC]GA).
3796	3	SB?(-1<JW).
3798	3	CL<HA;CP.
3800	3	CK<QA.
3802	3	GC;CJ"FT.
3804	3	SV"NT.
3806	3	CL<GB.
3808	3	AY&IQ;CX.
3810	3	CL"(DJ&(BC&KH)).
3812	3	KI<LH.
3814	3	FS"(GJ&OT).
3816	3	FQ"(CM@CX).
3818	3	UD'.
3820	3	CP<GQ.
3822	3	AN<OK.
3824	3	PZ"RY.
3826	3	EE'.
3828	3	CT<VF.
3830	3	EN&WZ.
3832	3	HC'.
3834	3	AY&(EU"SE).
3836	3	AN<JX.
3838	2	KY[GE.
3840	2	OJ"JK.
3842	2	UG"(BX&CI).
3844	2	AN<(LW[JX)!FU.
3846	2	EX;LJ"AR.
3848	2	(CU;AP)&(BD&CV).
3850	2	CP<VG.
3852	2	DL"(AA&JK)>DL.
3854	2	GF<LO.
3856	2	AY&NR;JL.
3858	2	FP<GE.
3860	2	CK<LD.
3862	2	OJ"FY;FP.
3864	2	KI<(FQ"FQ).
3866	2	XV"(FX!CM).
3868	2	CQ"RS>FT.
3870	2	(CU;FO);(EP;GW).
3872	2	CU;AT&JY.
3874	2	CO&(HB"LK).
3876	2	BE&IM.

3877	2	JQ<(BE&IM).	3878	2	FQ<(CU&WC).
3879	2	DN<(TT&(BD&JQ)).	3880	2	CU&(FO<FQ).
3881	2	JQ<(FR?NN).	3882	2	CL"DL"YV.
3883	2	CL<FO.	3884	2	CK<(CU&JO).
3885	2	CU&(RN"(JK;AZ)).	3886	2	CL<FP.
3887	2	FS"CL>JV.	3888	2	GK[SU.
3889	2	SU;HO.	3890	2	FS<(QQ;JO).
3891	2	FQ<QT.	3892	2	NO"UW.
3893	2	UV<(FR?(DO&OK)).	3894	2	CQ<((NH;FO)!AP).
3895	2	DN<(WT!AP).	3896	2	KI<UM.
3897	2	CU&(BD&KI).	3898	2	DG<(ED"GF).
3899	2	AC]AK.	3900	2	BF<(BG@EA;CK)).
3901	2	DN<(DC[(BM;CK)).	3902	2	(GC;FQ)"(CO&JM).
3903	2	YT'.	3904	2	SG"(DC[(GS;BA)).
3905	2	EM;FP>AR.	3906	2	QH"(DC[(GS;BA)).
3907	2	SG"IN.	3908	2	(UQ"IF);(DA!BF).
3909	2	FP<(FO&OC).	3910	2	KT"KR.
3911	2	FQ<(SI!DO).	3912	2	SI;FP.
3913	2	DN<(FO&HF).	3914	2	CQ<OX.
3915	2	CL<(CR;FP).	3916	2	UG"CX.
3917	2	CY&(BD&KI)!FP.	3918	2	DD<(BG@GA).
3919	2	CK<HZ.	3920	2	SV"(GJ&CP).
3921	2	NT;(NT"NT).	3922	2	QH<(NT;(NT"NT)).
3923	2	CL<(FO;DO).	3924	2	CU&UD.
3925	2	CQ<((HE"GP)IGG).	3926	2	CK<YY.
3927	2	KY[(QZ"(BJ&QB)).	3928	2	CU;SJ!JO.
3929	2	CK<(TB&(BD&AU)).	3930	2	CK<XB.
3931	2	DD&UT.	3932	2	FP<(JU&FW).
3933	2	(CU;AU)!(AU"AU)).	3934	2	NO<(BN[(CU&VF)).
3935	2	GK[GP.	3936	2	NF;JN.
3937	2	DN<(NH;FP).	3938	2	CL<(FR?QC).
3939	2	GF"(NN;(CW"GI)).	3940	2	AY&NR;JL.
3941	2	QH<(CU&(SD^SE)).	3942	2	NT"&CR;BL).
3943	2	CR;BL"WZ.	3944	2	WU"(NS[(JO;KH)).
3945	2	CL<XJ.	3946	2	DG<(JU&(NE"SE)).
3947	2	KT"(JO;FP).	3948	2	QS"(DA;CK).
3949	2	1C;WZ.	3950	2	PZ"(CR&KJ).
3951	2	FQ<(GA&PK).	3952	2	DI<OD.
3953	2	CL<SG.	3954	2	FP<QM.
3955	2	NO"JP.	3956	2	CK<PM.
3957	2	NT"(DT;CK).	3958	2	OM>BS.
3959	2	CL<UI.	3960	2	XL'.
3961	2	FQ"(AQ[BE).	3962	2	KG&(JO;FP).
3963	2	SC?CN.	3964	2	CQ"DE.
3965	2	EP&(AA&CF).	3966	2	KG&(HG"QE).
3967	2	CU&(OS^GH).	3968	2	JQ<(CU&(OS^GH)).
3969	2	BY@LM;QB).	3970	2	DI<(DC[XR).
3971	2	DD<(KG&DE).	3972	2	NE"(AT&AG).
3973	2	CU&(AN<JR).	3974	2	JL"CK.
3975	2	(DG"CL)>(AT&JY).	3976	2	VR"OD.
3977	2	UG"OD.	3978	2	NO"LQ.
3979	2	EH"CT.	3980	2	SY"(BC&FP).
3981	2	DN"RR.	3982	2	(CL"SY)"(BC&OC).
3983	2	CQ<((JZ\$GA)IFU).	3984	2	NP;ON>AR.

3985	2	NO"(CU&VS).	3986	2	CO&(GZ;CM)"QU.
3987	2	QH"(JO;FP).	3988	2	FO<(BD&QC).
3989	2	GZ"GZ!FC.	3990	2	CU!SO!FU.
3991	2	SG"(GJ&(EH[BA])).	3992	2	DH"(FO&OQ).
3993	2	CK<NV.	3994	2	GY"(CX&JR).
3995	2	MS!BC;FQ"WZ.	3996	2	YK'.
3997	2	CK<(HX;FO).	3998	2	BI'.
3999	2	OY!BC"UE.	4000	2	FQ"MA.
4001	2	JN"VA.	4002	2	AN<XU.
4003	2	CP;(CP"CP).	4004	2	NE"(JZ\$GA).
4005	2	FP<((QO"EY);KH).	4006	2	PZ"UP.
4007	2	(CL"QB)>(GU;GU).	4008	2	CK<(SR;JT).
4009	2	AA&DU;DE"AU.	4010	2	CU&((AA&ON);ON).
4011	2	NJ;CP.	4012	2	FS"(FO&(JS&DB)).
4013	2	KY[KO.	4014	2	FP<((WV!BC)!EA).
4015	2	GF"MC.	4016	2	VK?(-1"TD).
4017	2	CK<(BN[(PQ"GR)).	4018	2	DD<(DP[(DD;DD)).
4019	2	ED<(BN[(PQ"GR)).	4020	2	WU<(BN[(PQ"GR)).
4021	2	CK<(NS[(-1&QG)).	4022	2	CL"(CK&FQ).
4023	2	CL"(BE&MM).	4024	2	UG"(BE&MM).
4025	2	CU;MR!CP.	4026	2	JT"SK.
4027	2	CL<SK.	4028	2	GL[(AS;FO)].
4029	2	WU"(GL[(AS;FO)).	4030	2	FQ<YW.
4031	2	CU&YW.	4032	1	DT;CK"NK!FU.
4033	2	SG"JL>GF.	4034	2	KG&((JK;FW)"FT).
4035	2	CQ<(IH;(IH"IH)).	4036	2	AN<DT.
4037	2	CU&(LI^JL).	4038	2	NS[(-1&KO)"QE.
4039	2	ZR'.	4040	2	DP[(MS;IM).
4041	2	CU&(DC[(GS;DH)).	4042	2	YVIMK.
4043	2	CR;CK;OC>GR.	4044	2	CL"CW.
4045	2	BY&MA.	4046	2	LH"CT.
4047	2	UG"XU.	4048	2	FR?(EO&FQ).
4049	2	CL<(CU&ZC).	4050	2	YL;CV.
4051	2	DD<KV.	4052	2	KY[(WU"OK).
4053	2	SV"(BO&NU).	4054	2	GF"GB.
4055	2	YN!BD;QS!GX.	4056	2	DN<SS.
4057	2	CP"(LY;FQ).	4058	2	AE&KH>BK.
4059	2	DN<(AE&KH).	4060	2	GF"(AY&DF).
4061	2	NE"(AO]FO).	4062	2	QS"(UF!GG).
4063	2	FS<(AO]FO).	4064	2	HV'.
4065	2	QH"(DC[(GS!GG)).	4066	2	SS"EE;GW.
4067	2	RK"SF.	4068	2	DD&(QC"GB).
4069	2	FP"(BM&QB).	4070	2	LX'.
4071	2	CU&(DD;DD).	4072	2	SG"(JU&(AO]NO)).
4073	2	DD;OA"UE.	4074	2	(DG"QC)>(SO!CN).
4075	2	FP<(LI^NU).	4076	2	DI<(BD&UA).
4077	2	CK<(DD&UB).	4078	2	DL<CS.
4079	2	AN<(CW;CW).	4080	2	PZ"(CO&(AE+BR)).
4081	2	TA;GW.	4082	2	CQ<ZW.
4083	2	JT"(WT!AP).	4084	2	DP[(CV;(CV"CV)).
4085	2	XA>AR.	4086	2	WU"(FO;IB).
4087	2	JQ<(SI!DO).	4088	2	NO"(NT"CM);FS).
4089	2	WI'.	4090	2	FP"(AT&AP).
4091	2	SW;(SW"SW).	4092	2	CP<TL.

4093	2	CU&SO!CN.	4094	2	CR&(HY[DG]>AR.
4095	2	SD^UG.	4096	2	AN<CY.
4097	2	(BX&FP)"(EN]DE).	4098	2	ED"(CO&CN).
4099	2	QH<ML.	4100	2	CL<(SR;FQ).
4101	2	NE"(NJ;(CU!CM)).	4102	2	NE"LT.
4103	2	FO<OP.	4104	2	CT"((AF&ER);DO).
4105	2	NF&JW.	4106	2	FQ<(OZ^AU).
4107	2	KI"UE.	4108	2	NC'.
4109	2	QH"(LS;FP).	4110	2	FQ'.
4111	2	AE+CY.	4112	2	CU&(CP"CK).
4113	2	KT<(QV!CN).	4114	2	CQ"AI;NE.
4115	2	PG;PG.	4116	2	CQ<(LI^GH).
4117	2	QC"GB!FO.	4118	2	KT"KC.
4119	2	FP"KC.	4120	2	JQ<QQ.
4121	2	AN<(CR;(HY[DG)).	4122	2	NF&(FW"(AT&KF)).
4123	2	CL<((AY;IO)IAP).	4124	2	CU&((AY;IO);AP).
4125	2	FS<(CO&JT).	4126	2	NE"NE;WZ.
4127	2	JN"UT.	4128	2	1F'..
4129	2	CQ<TE.	4130	2	CL"PQ>FQ.
4131	2	CG@HW.	4132	2	NH;NN.
4133	2	CT<(FR?(DJ&NX)).	4134	2	GF<(FR?(DJ&NX)).
4135	1	NF&(AO]FO).	4136	2	DN"QZ.
4137	2	DG<((AA&NK);DA).	4138	2	WU<ZT.
4139	2	VJ"UE.	4140	2	DG<(BN[BW).
4141	2	DG<((FE^QQ)!CX).	4142	2	CQ"DF>AU.
4143	2	SG"(CO&CP).	4144	2	HJ](-1&(CO&CP)).
4145	2	CQ<((CM@CX);FU).	4146	2	(CL"ED)>(CX&JR).
4147	2	TX"UE.	4148	2	EX;(NN"NE)JER.
4149	2	BE&KF.	4150	2	CL<(BN[OM).
4151	2	DI<(AA&QY).	4152	2	NT"CT.
4153	2	CK<(CM@CX).	4154	2	CU&(JLIEM).
4155	2	XQ"DF>AU.	4156	2	CK<BA.
4157	2	SD^(BJ&NU).	4158	2	EP&KZ.
4159	2	CZ"CL>EG.	4160	2	GF;(GF"GF).
4161	2	CP"(CM@CX).	4162	2	CU&(CM@CX).
4163	2	XE'.	4164	2	KY[(CT<ZG).
4165	2	LE&WZ.	4166	2	KY[UM.
4167	2	SG"UM.	4168	2	DN<LE.
4169	2	QB"QB;OT.	4170	2	TB;BD;NE.
4171	2	CL<UI.	4172	2	CU;JLICP.
4173	2	FP"(IL[(-1&BW)).	4174	2	BD&((JL;CP)"VU).
4175	2	PZ"(JL;CP).	4176	2	CU&(CO&GV).
4177	2	NE"(CO&LF).	4178	2	SJ;HO.
4179	2	BG@(DJ;EC).	4180	2	RMIBC.
4181	2	KY[(UY!FU).	4182	2	CW"BW&WZ.
4183	2	CP"(GJ&(EH[BA)).	4184	2	EM&CV.
4185	2	AY&(EU"SE)!DO.	4186	1	NN"GE.
4187	1	CQ"GE.	4188	1	CL<(SJ;(UV"FQ)).
4189	1	CQ"(QT!CN).	4190	1	NF&(SK"KP).
4191	1	DN<((AP;BD);CV).	4192	1	CQ"HL.
4193	1	DI"HL.	4194	1	NE"LL.
4195	1	CU&KU.	4196	1	AN<(HH&(BD&FW)).
4197	1	FX;JX.	4198	1	CL<HQ..
4199	1	CP<HQ.	4200	1	HQ'.



4201 1 KT"VG.  
 4203 1 RS"FT;DL.  
 4205 1 BY@GK[KJ].  
 4207 1 (RI"DQ)&ZA.  
 4209 1 SG"(AQ[DH].  
 4211 1 NF&(LN"VG).  
 4213 1 CL<VH.  
 4215 1 FS<(CG@AA&DH)).  
 4217 1 CQ"LA.  
 4219 1 KY[((DP[CK)"QL).  
 4221 1 NH&JT"PM.  
 4223 1 JQ<(NH;JT).  
 4225 1 CU;(JN;CK).  
 4227 1 NO"((CU;FO)!CX).  
 4229 1 CU&(DC[(SR;DF)).  
 4231 1 SJ&(RN"QD).  
 4233 1 SG"(NJ!CX).  
 4235 1 FP"LS>FPIFU.  
 4237 1 XJ;NN.  
 4239 1 CP"TC.  
 4241 1 SD^HO.  
 4243 1 CU;JQ.  
 4245 1 CK<GP.  
 4247 1 DH"EW.  
 4249 1 OJ"FW.  
 4251 1 QH"(AN<CN).  
 4253 1 JU&FX.  
 4255 1 KT<(AN"GP).  
 4257 1 CL<(HI&PV).  
 4259 1 KY[(CU&(CR;CK)).  
 4261 1 AN<EL;DD.  
 4263 1 PZ"((CY;JU)!QB).  
 4265 1 NF&(WT!AP).  
 4267 1 SI;JO.  
 4269 1 HV!AA.  
 4271 1 CK<(HR;FP).  
 4273 1 KT"(OC;JK).  
 4275 1 DD&((SW!BH)"UE).  
 4277 1 JQ<BT.  
 4279 1 QH"(EM;FP).  
 4281 1 GF"(JS;DR)>FT.  
 4283 1 QH"(FO&OC).  
 4285 1 CU;BE!CK.  
 4287 1 KY[(WX"SE).  
 4289 1 SG"(SI!DO).  
 4291 1 CL<SI.  
 4293 1 FO&HF>AR.  
 4295 1 DN"(AV&KE).  
 4297 1 KG&OX.  
 4299 1 FP<(EB?(AE+CY)).  
 4301 1 CK<UZ.  
 4303 1 CM@IN.  
 4305 1 DP[NV"FY;FQ.  
 4307 1 IV"DQ.

4202 1 DN<UW.  
 4204 1 NO<(GK[KJ]).  
 4206 1 FP<ZA.  
 4208 1 CQ<(DP[(AV&GQ)).  
 4210 1 OG"GE.  
 4212 1 CL"VG.  
 4214 1 DI"FX.  
 4216 1 CL<LD.  
 4218 1 FP<HQ.  
 4220 1 CP<(PL!HQ).  
 4222 1 GF<(NH;JT).  
 4224 1 CU&QT.  
 4226 1 QH"YA.  
 4228 1 DG<(DC[(SR;DF)).  
 4230 1 JL"MT.  
 4232 1 CU&VF"AU.  
 4234 1 FS"(IB;JQ).  
 4236 1 CL<(GS&RH)!FU.  
 4238 1 DL"NT.  
 4240 1 CQ"KN.  
 4242 1 CL"(KN!FO).  
 4244 1 CL"FQ>GE.  
 4246 1 NE"(QQ;JO).  
 4248 1 FS<GX.  
 4250 1 GF"(DA&GZ).  
 4252 1 CU&HG.  
 4254 1 AN<PA.  
 4256 1 NO"(GA;JO).  
 4258 1 JL;FO"UW.  
 4260 1 UV"KR.  
 4262 1 FS<(AN<EL).  
 4264 1 WT!AP"CT.  
 4266 1 CK<(GF;GF).  
 4268 1 QH"(KK&QF).  
 4270 1 CP<(HH&(BG@JP)).  
 4272 1 LN"(HR;FP).  
 4274 1 KI"(BG@EA;CM)).  
 4276 1 AN<JO.  
 4278 1 SG"(JU&SS).  
 4280 1 JQ<IN.  
 4282 1 CU&DA!BF.  
 4284 1 QH<(FR?(DO&OK)).  
 4286 1 CK<(AO!OT).  
 4288 1 NH;FO!AP.  
 4290 1 AN<(SI;XQ).  
 4292 1 FQ<(OZ&PZ).  
 4294 1 CP"(FO;JM).  
 4296 1 JT"OX.  
 4298 1 JBIIX.  
 4300 1 JO"BT.  
 4302 1 CL"(DD&OA).  
 4304 1 FQ"QG.  
 4306 1 AN<(BG@GA).  
 4308 1 CZ"(BG@GA)>EG.

4309	1	DN"UF>AU.	4310	1	QI'.
4311	1	CQ<(EP&JT).	4312	1	HJ](-1&EM).
4313	1	DG"CP>BA.	4314	1	FS"(DU;(HP@BX)).
4315	1	CL<((BM;FO)IAP).	4316	1	CL<UL.
4317	1	DN<(DP[AS).	4318	1	AN<(NU;AZ).
4319	1	PZ"(OC&(BC;DQ)).	4320	1	CQ<((HG"HG)&QC).
4321	1	CQ<YY.	4322	1	DG<(NW;QV).
4323	1	AN<(NW;QV).	4324	1	CQ"(SJ;JO).
4325	1	SG"(SJ;JO).	4326	1	YR^OK.
4327	1	OG'.	4328	1	AN<(GL[AS).
4329	1	QS"(DA;CK).	4330	1	VR"XB.
4331	1	XB'.	4332	1	NO"XB.
4333	1	CQ"XB.	4334	1	HO<(SD^UP).
4335	1	FP<(PE"CT).	4336	1	CL<VV.
4337	1	CL<(VV"SE).	4338	1	KY[(CU&VF).
4339	1	DG<(GK[GP).	4340	1	1D>CT.
4341	1	CQ"(GK[GP).	4342	1	DG<XW.
4343	1	CL<XW.	4344	1	KY[(LZ;JO).
4345	1	KG&DH.	4346	1	XJ;(HO;CM).
4347	1	DN<((AY&NR);JL).	4348	1	CU&(SD^SE).
4349	1	DG<SQ.	4350	1	CU&(CR;BL).
4351	1	NE"(DO&MM).	4352	1	UG"(JO&NE).
4353	1	(NF;JU);(NE"SE)).	4354	1	CQ<(NS[(JO;AU)).
4355	1	OC;(BC^DQ)>GU.	4356	1	KI<ZM.
4357	1	(SD^RG).	4358	1	FP<(SD^RG).
4359	1	1C;GW.	4360	1	CL<SR.
4361	1	JJ?IA.	4362	1	KY[(AT&AG).
4363	1	SD^(CR;CK).	4364	1	NF&VQ.
4365	1	FP<VQ.	4366	1	QR"CT.
4367	1	DI"lQ.	4368	1	JJ?((QO"EY);KH).
4369	1	KI"EH.	4370	1	JL"RR.
4371	1	DC[((ID&BC)^QB).	4372	1	CU&(DR"PM).
4373	1	JU&JP.	4374	1	NH;QB.
4375	1	AN<JP.	4376	1	QR'.
4377	1	KT"OM>BS.	4378	1	DI<UI.
4379	1	FP<((JS;DR)"CT).	4380	1	FP"MH.
4381	1	SD^OM.	4382	1	BY@QC"BP).
4383	1	FP"(CR&(NM;FO)).	4384	1	WU"(BN[(PQ"GR)).
4385	1	YO>AR.	4386	1	CQ"(JY;QB).
4387	1	OD"UE.	4388	1	JL"(JO;FP).
4389	1	DI"JR.	4390	1	DN"(DD&QF).
4391	1	GF"(AY&BI).	4392	1	VR"JP.
4393	1	KG&(DP[(DD;DD)).	4394	1	CL"(CR&(NM;FO)).
4395	1	NF;LM;QB.	4396	1	CK<(JO;FQ).
4397	1	FP<(CM@FP).	4398	1	NF&(BY@FS).
4399	1	PZ<(ED>FS).	4400	1	NO<VB.
4401	1	CL<(CM@JP).	4402	1	CL<(GA&PK).
4403	1	HJ]OD.	4404	1	CK<(JS&(BD&QG)).
4405	1	DI<(JS&(BD&QG)).	4406	1	CK<(NK;(MS;AP)).
4407	1	FO;GH.	4408	1	QS"lQ.
4409	1	NK;JO!ER"EH.	4410	1	LQ"CT.
4411	1	SD^DT.	4412	1	CR;(AC;CM)"UE.
4413	1	CL<(NS[(-1&MD)).	4414	1	(CZ"JP)"(FQ"EG).
4415	1	SV"(JP"FQ).	4416	1	DL<PM.

4417	1	GK[(CK&GE)..	4418	1	EP&(AA&CF)"PM.
4419	1	UG"(GS&OF).	4420	1	JL"CK.
4421	1	DC[(SR;IH).	4422	1	PZ"VT.
4423	1	CL"(CO&GV).	4424	1	PL;CX.
4425	1	KY[(PL;CX).	4426	1	CO&QO.
4427	1	OZ^QG.	4428	1	CU;BD&QC.
4429	1	CL<(FO;HQ).	4430	1	NF;JK!FS.
4431	1	CT"(JK;FS).	4432	1	FS<XR.
4433	1	CL<XR.	4434	1	PZ"DE.
4435	1	SG"(CO&(AQ[BE))).	4436	1	VZ^NV.
4437	1	JO"(CX&JR).	4438	1	JU&(UV"UG).
4439	1	BM;CK>AI.	4440	1	CK<(CY;CK).
4441	1	TG'.	4442	1	CK<(AT&AG).
4443	1	CK&NT"GU.	4444	1	XJ!BI.
4445	1	QC+CE"FY;NE.	4446	1	UG"((ND;JO)!NV).
4447	1	CU&(WU>AR).	4448	1	SJ&YW.
4449	1	JL"(JO;MM).	4450	1	FS"AU>CK.
4451	1	CL"(OY!BC).	4452	1	TK;GU.
4453	1	NH&QB.	4454	1	CQ"(CY;CK).
4455	1	PZ"(CY;CK).	4456	1	OK"VA.
4457	1	PZ"(FV]CU).	4458	1	CP"NQ.
4459	1	ED"NQ.	4460	1	SV"NQ.
4461	1	CQ"JL>GF.	4462	1	CU&SU!AA.
4463	1	FP<(BY@EZ).	4464	1	EK?BS!CK.
4465	1	NE"WA.	4466	1	NF&(GU;GU).
4467	1	HW"ZF>EL.	4468	1	SG"(EB?NP).
4469	1	(CU&MN);(GG;KH)..	4470	1	UV"((AA&ON);ON).
4471	1	FW"(AT&JW).	4472	1	CU;GC!FQ.
4473	1	DN<(FO&(JS!DB)).	4474	1	KY[(AA&DU);DE).
4475	1	QH"(DP[(AC]DG)).	4476	1	CQ"(AO]NN).
4477	1	CL<KO.	4478	1	CU&MC.
4479	1	CL<(AO]DG).	4480	1	FP"(BO&JX).
4481	1	CU&(BN[(PQ"GR)).	4482	1	CQ<((JQ"JQ)&VS).
4483	1	SE;MY.	4484	1	BD&QC"KP.
4485	1	JO<OM.	4486	1	NE"(CX&JR).
4487	1	BM&DV.	4488	1	JN;CP.
4489	1	FP<(IH;(IH"IH)).	4490	1	UV"(EO&FQ).
4491	1	CT"DT.	4492	1	BJ&NU"WZ.
4493	1	DG<(CR&VV).	4494	1	CL&FU.
4495	1	HB"GU.	4496	1	CK<(CR&(HY[DG)).
4497	1	CU&(CL<(GC;FQ)).	4498	1	FS<(NS[(-1&QG)).
4499	1	KG&DL.	4500	1	CU&DL.
4501	1	FO<(BX&(AQ[DH)).	4502	1	FO<ZR.
4503	1	CP"(NK;FU).	4504	1	CZ"(GO&IJ).
4505	1	FR?VB.	4506	1	KI"(OY!BC).
4507	1	AN<(HQ;JK).	4508	1	CY;CK"UE.
4509	1	FP"QN>CN.	4510	1	NF&ZC.
4511	1	EO&FQ.	4512	1	CK<(GL[(-1&CV)).
4513	1	DG<(AN<FP).	4514	1	CP<(SD^FP).
4515	1	CU&(WU"OK).	4516	1	CU&QE.
4517	1	SG;(SG"SG).	4518	1	FS<OP.
4519	1	GQ"CT.	4520	1	FO<(AO]DG).
4521	1	QS"(CE@BX).	4522	1	FO&(KO"AU).
4523	1	SJ;FC.	4524	1	CU;CO&PB.

4525	1	FS"(CO&PB).	4526	1	JQ<(AY&DF).
4527	1	GF<(WMIGG).	4528	1	NO<YB.
4529	1	EI"EI;NV.	4530	1	QH"XY>CT.
4531	1	JT"GO.	4532	1	KF"SE.
4533	1	HE;GF.	4534	1	FP;KR.
4535	1	QC"(IG;FQ)>FT.	4536	1	DN<(NT;(NT"NT)).
4537	1	CK<(NT;(NT"NT)).	4538	1	QC"NT>AI.
4539	1	OC;SE.	4540	1	KV;FQ.
4541	1	WU"((AY&NR);KO).	4542	1	FP"(GU;GU).
4543	1	CL"VC.	4544	1	FP<(LI^JL).
4545	1	VC"HT.	4546	1	FQ"(AV&GH).
4547	1	XJ;((JN;FO)!AP).	4548	1	DH<(SI;GW).
4549	1	CL"DL>SL.	4550	1	KI"PH.
4551	1	CU&PH.	4552	1	SG"PH.
4553	1	PZ"PH.	4554	1	QH"({JU&(AO]NO)).
4555	1	CL<SF.	4556	1	FP<IC.
4557	1	CQ<(FR?UI).	4558	1	CQ"(DD;DD).
4559	1	CQ"PT.	4560	1	HB"CY;CX.
4561	1	DN"(BQ&BE).	4562	1	QH"UF.
4563	1	KT<(CC[(NS[BI)).	4564	1	HH&(BD&DH)!CK.
4565	1	GF<(SX]FO).	4566	1	DG"AS.
4567	1	CL"FM.	4568	1	DI"MG.
4569	1	SV"ZW.	4570	1	CL<((AY&NR);KO).
4571	1	PZ"(BO&NU).	4572	1	SD^(FO;IB).
4573	1	DN<SL.	4574	1	FP"(KK&QF).
4575	1	CL"TW>FT.	4576	1	UG"(KV;CF).
4577	1	JL"(GJ&KS).	4578	1	XQ"(DD;DD).
4579	1	GF"GR.	4580	1	CT<UZ.
4581	1	SG"ES.	4582	1	DN<(JN&QD).
4583	1	DP[NN.	4584	1	FP"(AY&DH).
4585	1	CK<(NF&RY).	4586	1	UR?BR.
4587	1	SJ;HO.	4588	1	CQ"GB.
4589	1	NF&(NZ"(AA&DH)).	4590	1	CP<ML.
4591	1	OK"((AY&NR);KO).	4592	1	PZ"DD.
4593	1	FQ<((NJ;CU)!CK).	4594	1	CQ"IC.
4595	1	CP"PH.	4596	1	CL<(UQ"CN).
4597	1	(RI"DQ);KS.	4598	1	CQ<ZV.
4599	1	CK<(SJ;OA).	4600	1	NF&TL.
4601	1	VM!JQ.	4602	1	SG"((CO&QU)).
4603	1	OK"(FV]AP).	4604	1	ZK"HQ.
4605	1	QC"(DU;JO).	4606	1	BY@DH.
4607	1	CK<(BY@DH).	4608	1	FO;(BN[AW).
4609	1	SM;NX>CT.	4610	1	NN<((EK?BS);FO).
4611	1	QC"GB;SG.	4612	1	AV&NMI"FO"MJ.
4613	1	(DG"FW)>(AT&KF).	4614	1	DG<(FO&SM).
4615	1	XN!EP!NE.	4616	1	CQ<((XN!EP)!NE).
4617	1	KY[(GO"AS).	4618	1	QK[(-1&DE).
4619	1	CU&(BF<GR).	4620	1	AN<(AC]GA).
4621	1	WU"XG.	4622	1	OU;(BC^DQ).
4623	1	AY;IO!AP.	4624	1	(JZ\$PJ);(CK;IJ).
4625	1	KY[((AY;IO)!AP).	4626	1	FS"((HPECW)!FU).
4627	1	CP<KB.	4628	1	AN<DM.
4629	1	FQ"(JO;FU).	4630	1	CU&VU.
4631	1	CU&(XB"FT).	4632	1	BE;EP;DQ.

4633	1	CU;BD;TO.	4634	1	NF&WN.
4635	1	CL<(JQ"SE).	4636	1	DD;SE!MY.
4637	1	WS!FU.	4638	1	CP<QI.
4639	1	DG<(AA&QY).	4640	1	DN<VJ.
4641	1	VJ"WZ.	4642	1	CQ<(BN[OM).
4643	1	CK<((OH;FU)IDA).	4644	1	GC;CJ"FT!GG.
4645	1	FR?((GC;CJ)"FT).	4646	1	XJ;SG.
4647	1	OG"(JO&LR).	4648	1	DG<XT.
4649	1	DC[(EP&KZ).	4650	1	PZ"(JN;FO).
4651	1	LE;KH.	4652	1	KY[PR.
4653	1	SV"(BE;CK).	4654	1	CI"AR.
4655	1	PZ"(AS;FO).	4656	1	YH"((BF"GR)!FU).
4657	1	NE"(DJ&(BC&KH)).	4658	1	CQ<(CK;GE).
4659	1	SG"(DJ&(BC&KH)).	4660	1	FQ<TF.
4661	1	HJ][(-1&AA)+QY).	4662	1	GF<(GS&OF).
4663	1	CK"(AF[BE).	4664	1	AN<(GJ&OT).
4665	1	KG&(DF"AU).	4666	1	FP;FO.
4667	1	GJ&OT"WZ.	4668	1	JT"(AQ[CK).
4669	1	KY[(UO!DD).	4670	1	AN<(BY@ (FO;CP)).
4671	1	(AY;BC);(DG;AZ).	4672	1	YZ;UN.
4673	1	DI"NL.	4674	1	CL"(GJ&OT).
4675	1	UV"LE.	4676	1	NJ;FU.
4677	1	CP<(CU&LE).	4678	1	TB&(BD&GT).
4679	1	YR^CP.	4680	1	CL<(YR^CP).
4681	1	CL<(SZ!GG).	4682	1	CP<(SZ!GG).
4683	1	DN<(SZ!GG).	4684	1	CU&UI.
4685	1	CU&(JZ\$(AA&CP)).	4686	1	AN<(JO;IK).
4687	1	CL<(NE"SE).	4688	1	GF"VT.
4689	1	NO"(CO&(CW"BW)).	4690	1	JO"(CO&(CW"BW)).
4691	1	HO&NE.	4692	1	DN<(BG@ (DJ;EC)).
4693	1	CU&(BC^BE);OC.	4694	1	CU&(RM!BC).
4695	1	CR&FP;JO.	4696	1	WR'.
4697	1	QU"GR!FU.	4698	1	NP'.
4699	1	DI<(FO&JN).	4700	1	SG"MB.
4701	1	BN[(JK;DB)!FU.	4702	1	CU;HC.
4703	1	OG"HC.	4704	1	NF&(DI"(AO]BF)).
4705	1	CL"(CK&QB).	4706	1	QS"(FO&KH).
4707	1	DU&(CK&GE).	4708	1	BL&JX!FU.
4709	792	CP<CS.	4710	368	GY<CS.
4711	10	NF&(CM@JP).	4712	1	BC^HC.
4713	349	KT"QD.	4714	577	CU&SF.
4715	36	CP"KM.	4716	177	VC'.
4717	4	BM;CK!GG.	4718	2	AN<KU.
4719	2	NE"((AV;CK)!FU).	4720	1	AP;GS.
4721	150	CK<QI.	4722	27	SD^(AV&GH).
4723	3	SG"(AF+HG).	4724	1	CK&BZ.
4725	7	KM'.	4726	2	AA&(CE@JO).
4727	14	CL<VL.	4728	13	DL"(BE&NO).
4729	34	NE"(GU;GU).	4730	7	CF"FT.
4731	153	CZ"VT>EG.	4732	108	QU"BK.
4733	1	CD]CU.	4734	5	FE@AW!AA!BH.
4735	131	LC"(CW;CW).	4736	1	CQ"(DP[JP)].
4737	1	FN"FN.	4738	17	CK<((CR;AD)!FU).
4739	70	GJ;DF!CX"WZ.	4740	14	HY[(-1&CK)"OK.

4741	1	DI<((AT;CK);KH).
4743	2	IN"CT.
4745	19	CK<OP.
4747	3	PZ"KL.
4749	41	FQ"QU>CT.
4751	1	CO;FU;KS.
4753	47	EM'.
4755	3	DN<(QT!CN).
4757	5	SY"(BC^FP).
4759	2	CQ"OM.
4761	8	JO&(DA;CK).
4763	9	CQ"KR.
4765	28	JL"LG.
4767	1	FP"(NN;CP).
4769	40	VZ"(WH"GB).
4771	32	GF"(CM@CX).
4773	38	CL"(CK;AZ).
4775	1	FR?((AH;AA)&IQ).
4777	2	DC[((AA&NK)!DA).
4779	13	GF<LD.
4781	27	CL<IZ.
4783	3	UL"GP.
4785	20	XK?(-1"JF).
4787	4	QC"(OA;CX).
4789	2	DN"GB.
4791	19	FO<1D.
4793	3	DD<(DA;GZ).
4795	5	FQ<(OZ;QB).
4797	4	TR>AR.
4799	4	FQ"KR.
4801	1	YM>EQ.
4803	15	CR;FP.
4805	4	OI&(BN[(TI"FT)).
4807	12	CL<PT.
4809	6	SG"QT.
4811	10	(JK;DH)"(AA&NE).
4813	7	WX"GR.
4815	1	CL<(SD^(DT;CM)).
4817	3	CT"(OY!BC).
4819	1	CQ<((DD;SE)!EM).
4821	2	CQ<((DX"AS);FQ).
4823	7	SG"(AO)CK).
4825	4	NE"(JZ;EM).
4827	6	CQ<(CM@FP).
4829	1	GF"RR.
4831	1	PZ"(GS&OF).
4833	2	KI<(JZ\$GA).
4835	4	CP"KI.
4837	1	RQ"UE.
4839	5	GK[SE.
4841	3	QC"(DP[(CU;IK)).
4843	3	CQ<(SI;LH).
4845	2	CK<KQ.
4847	1	MZ!FU.

4742	4	NO'.
4744	1	GF"BT.
4746	27	TJ"(CO&LF).
4748	1	CU&(NE"(AO+AB)).
4750	12	NF&(SD^FQ).
4752	4	BA"BA.
4754	46	ED"SF.
4756	2	GZ'.
4758	45	GK[CK"FT.
4760	20	EB?KV.
4762	2	FX;KH.
4764	2	SG"(CR&(HY[DG)).
4766	48	HB"FP.
4768	27	MX'.
4770	1	VZ^(QF"CN).
4772	27	CU&SF.
4774	34	QH"(GC;QB).
4776	19	FP"EH.
4778	20	KI<LD.
4780	31	CL<ZB.
4782	3	DI<((OY!AA);NR).
4784	1	UN'.
4786	13	TQ'.
4788	4	CT"(FO&JM).
4790	9	CQ<YU.
4792	3	CK<DV.
4794	22	BF<GD.
4796	1	MU"QZ.
4798	2	NN"(BM;CK).
4800	7	GF<VE.
4802	10	KI<(SO!CN).
4804	6	EQ"(HX;FO).
4806	16	CU&(PZ"SF).
4808	10	AO]BE.
4810	3	KI"(KR;CN).
4812	5	CL<NH.
4814	9	TJ'.
4816	2	CL<(BL&JX).
4818	3	FS"(JS;DB).
4820	2	NT"GO.
4822	7	HO<TH.
4824	3	SV"(VP][AW"-1)).
4826	1	ZY"UE.
4828	7	QH"(CO&JT).
4830	7	CK&QB"AU.
4832	1	RN"QD.
4834	5	FP"((CE@BX);MM).
4836	1	CK"RW>BK.
4838	4	CK&DH.
4840	2	NT"IZ.
4842	2	CU&SF.
4844	1	DD&(FP"(BQ&BE)).
4846	1	SF"QE.
4848	3	(LK"FT);(BN[QD).

4849 2 NJ; (AZ?(-1>BE)).  
 4851 1 QV;FQ.  
 4853 1 BO&FC"CT.  
 4855 1 PSI BD;KO.  
 4857 1 DU;JO!FP"AU.  
 4859 2 GF"DO.  
 4861 1 SG"KU.  
 4863 1 DT;CK"LQ!FU

4850 2 CK<(CK;AZ).  
 4852 2 JN<OC.  
 4854 1 CK<(CMX).  
 4856 1 OT<((NH;FO)!AP).  
 4858 1 AO+(AB"-1).  
 4860 1 NN"(DC[DO).  
 4862 1 JO;HQ.  
 4864 1 NF&HY.

TOTAL OF "-1"RADICAL = 116

0001	0016	0031	0046	0061	0076	0091	0106	0121	0136
的	們	會	也	西	行	部	之	定	常
一	上	生	作	方	事	同	山	外	業
是	三	地	後	校	起	八	沒	然	因
我	這	五	多	六	所	動	最	加	些
了	中	年	下	本	美	爲	經	工	候
有	到	家	着	面	南	什	課	由	名
國	個	說	子	過	兒	月	分	還	心
不	和	用	很	教	公	爲	於	物	力
在	以	第	日	樣	東	做	開	電	進
他	就	小	麼	能	圖	七	又	主	前
人	學	可	成	那	自	明	師	江	得
大	要	都	你	北	市	海	老	氣	文
十	天	去	看	發	法	兩	等	從	媽
二	時	裏	民	把	種	高	各	新	路
來	四	好	出	水	對	九	如	長	軍



0151	0166	0181	0196	0211	0226	0241	0256	0271	0286
問	華	車	育	比	星	肉	父	金	德
立	現	表	原	度	長	安	王	英	母
機	叫	已	地	將	林	其	黃	建	廣
使	吃	報	空	重	題	那	別	門	清
道	主	怎	總	實	飛	問	邊	爸	議
而	每	共	省	再	條	花	親	舉	及
當	合	得	通	走	快	闊	代	只	午
太	次	位	活	被	情	才	習	化	任
河	果	向	並	給	先	身	遍	產	接
點	但	手	它	口	火	鐵	界	單	無
寫	今	幾	見	聲	世	白	失	呢	達
政	臺	想	理	利	球	形	聽	馬	布
回	體	正	或	像	真	打	風	統	類
頭	書	字	便	光	元	話	知	運	陽
平	百	意	員	期	跟	院	號	放	愛

0301	0316	0331	0346	0361	0376	0391	0406	0421	0436
帶	結	參	語	治	者	讀	拉	養	改
女	級	辦	論	士	務	備	古	土	故
樹	病	住	目	決	信	討	照	壘	考
斯	入	處	更	遠	聯	器	提	練	研
社	畫	功	食	千	島	和	計	且	喜
爾	灣	交	受	服	望	眼	保	往	晚
己	許	州	節	孩	拿	收	選	隊	至
縣	府	造	流	線	木	周	半	歡	黑
完	子	色	强	石	該	蘇	朋	筆	除
請	應	弟	非	早	區	數	品	陸	湖
張	印	科	講	傳	告	容	直	命	射
俄	相	集	約	班	料	隻	步	衣	注
音	特	連	交	指	巴	死	飯	哥	察
此	組	近	觀	設	童	結	里	究	遺
萬	義	亞	少	防	熱	導	洱	送	場

0451	0466	0481	0496	0511	0526	0541	0556	0571	0586
農	神	皮	初	羅	製	草	官	際	站
菅	城	性	基	佳	精	歌	勢	呀	牛
衛	與	必	影	覺	示	乘	起	毛	抗
滿	唱	害	哈	春	福	雲	米	菜	夏
笑	稱	極	列	武	陳	裝	房	李	持
洋	織	取	妹	荅	轉	解	希	鄉	附
玩	編	油	夫	記	雨	專	處	展	輕
克	權	青	始	委	京	雖	船	念	整
兵	商	跑	試	根	溫	室	司	規	左
反	消	票	興	夠	田	買	易	程	復
領	片	港	輪	件	麗	感	爹	談	坐
却	帝	漢	頂	久	良	蘭	苦	龍	盛
遊	阿	助	嗎	據	離	亮	詞	具	術
廢	認	求	較	團	訊	包	應	細	象
樂	算	求	都	錢	吧	興	難	職	甘

0601	0616	0631	0646	0661	0676	0691	0706	0721	0736
推	單	康	調	份	絲	另	途	藥	排
尼	醫	識	虞	鐘	燈	繼	止	護	棉
鳥	首	洗	紙	鹽	革	分	畢	畫	刻
紅	思	竹	停	夜	姐	訂	努	質	充
禮	忙	費	令	蟲	劉	攻	冷	尺	格
找	啦	台	羣	村	落	響	雄	幫	置
曾	息	角	漸	律	紀	版	證	救	叔
魚	準	著	怕	齊	播	川	蛋	志	依
何	啊	深	破	續	塊	宗	投	脚	威
祖	央	法	足	跳	歲	板	升	奇	香
肉	須	雞	園	航	範	派	寶	趕	重
葉	誰	切	健	局	庭	館	蜂	壞	隨
爭	朝	菜	增	匪	修	睡	獎	需	鄭
沙	昨	查	慢	居	殺	素	穿	倫	馬
讓	案	演	密	汽	預	樂	視	適	廳

0751	0766	0781	0796	0811	0826	0841	0856	0871	0886
例	宣	免	岸	域	秋	似	寮	斷	擊
魯	屋	頓	引	卽	採	補	臨	鉛	植
酒	玉	甲	微	舊	右	麥	戶	狀	榮
傷	維	章	低	野	呼	副	竟	終	賣
材	般	靜	留	替	急	環	歐	彈	抵
鏡	剛	吸	綠	敢	句	言	嚴	構	雷
家	施	願	晴	麻	標	毒	街	係	液
則	富	燒	仍	肥	忽	姊	雪	晨	訪
訴	寧	錯	貴	退	系	曲	訓	蠶	休
狗	榮	暗	價	底	枝	席	週	痛	勝
乾	慶	營	屬	怪	牙	敗	掃	憲	假
式	責	圍	波	緊	績	嘴	芳	味	承
種	臉	季	景	協	致	境	旗	伯	雙
端	箭	亂	族	普	濟	掉	鎮	短	若
簡	永	史	冊	供	善	糖	未	冬	沿

0901	0916	0931	0946	0961	0976	0991
骨	劍	守	羊	積	歸	含
謝	述	吳	滅	菌	啓	辛
黨	移	博	負	銀	舞	少
趣	喝	歷	確	倒	拍	耳
順	資	效	招	泰	稻	烏
挫	迺	宣	彩	胡	掛	振
迎	客	蒙	顏	段	潔	昌
腦	支	男	豐	突	優	孫
敬	燃	幸	態	廠	玻	粉
限	棒	絕	納	圓	胞	森
桌	豬	侵	核	幹	佈	
敵	待	染	險	顯	蕭	
烈	礦	私	薄	仁	迪	
盡	皇	壓	獨	勇	頂	
針	占	封	靠	背	偷	

1001	1016	1031	1046	1061	1076	1091	1106	1121	1136
您	鄰	淨	滑	喊	括	郵	柏	調	窗
遼	錮	血	珠	伸	檢	零	冰	鼓	繞
了	寒	熟	測	抱	益	固	粉	行	拜
慣	津	旅	耍	逃	危	宮	梁	肌	賓
吉	秀	韓	杯	錄	祕	床	卡	輪	門
僑	陣	鼠	洞	乙	蜜	異	獲	游	店
吹	藥	源	橋	苻	凡	配	疾	戴	陶
過	松	丹	琴	渡	會	堂	禁	困	鬧
盤	按	略	忠	哭	寄	樓	蒸	洪	乎
灰	蔣	肯	層	恐	援	諸	刷	架	艦
換	爬	堅	速	減	暴	否	值	塞	僅
座	泥	伊	偉	刀	豆	銅	駐	幼	煙
慈	隆	尤	煤	概	警	假	藏	忘	陰
操	檢	的	擔	顧	柴	雜	財	繁	倒
模	疆	互	孔	桂	磁	存	譯	追	璃

1151	1166	1181	1196	1211	1226	1241	1256	1271	1286
荷	膠	池	技	嘉	巨	綏	延	給	多
驚	額	罷	距	降	錫	聞	漁	競	敦
着	餘	避	捉	劇	祝	盆	捕	缺	將
聖	佛	摩	墨	型	幕	奮	弄	徐	君
散	暖	孟	婦	佔	溪	均	靈	抓	勤
揚	糧	庫	彈	忍	蔗	峽	陵	套	旋
唐	橫	懷	浪	災	齒	暫	款	蓋	珍
序	仙	借	祗	宋	超	夢	剪	厦	雅
兄	相	貓	浙	瓦	束	苗	惡	姓	莫
街	魏	輔	楚	罵	稅	坦	閱	掌	猛
藝	婆	得	擦	透	弱	脫	碰	煮	肺
爆	典	徵	楊	揮	椅	紉	蝶	澳	番
脈	涼	尾	亡	激	塔	桿	隔	礮	踏
複	瓜	淡	況	跡	炸	逐	購	半	輞
恨	既	覽	虎	教	藏	酸	宏	摸	汗



1301	1316	1331	1346	1361	1376	1391	1406	1421	1436
醒	汪	貨	筒	疼	督	曼	系	覆	量
熊	聰	介	郎	奴	難	妙	彎	肚	谷
甚	肅	牆	呂	鮮	結	麵	菲	奪	繪
鴨	壁	桃	華	迫	窩	貼	嶺	朶	井
氧	填	鞋	覺	牧	丁	露	騎	亨	曲
批	秦	耕	漆	姑	勒	喀	轄	震	享
干	祥	泉	孝	穀	惠	擴	臣	征	中
屈	沉	召	陷	邱	還	殼	誠	軟	貝
閃	尚	壤	獻	差	搶	圈	申	縮	飄
黎	瑞	臟	智	舍	汁	曉	審	胃	評
洛	載	俗	畜	舒	髒	播	粗	伴	髮
厚	謀	奧	損	遭	阻	抽	役	邾	堆
監	壘	碗	擺	策	曹	氏	仰	返	嫩
執	獵	坡	搬	濱	飼	刺	握	腿	軌
莊	溝	培	登	佩	末	殘	飽	淚	貢

1451	1466	1481	1496	1511	1526	1541	1556	1571	1586
柯	更	欣	薩	蔡	讚	緬	曆	賢	蚰
微	杭	釋	鬆	泡	蒼	番	蓮	箱	斤
錦	遷	裳	儀	撲	姆	浮	傑	軸	窮
殖	折	纔	奉	帽	炭	藍	降	擇	拾
赤	淮	促	耐	罰	甜	裂	濬	仔	蝕
賞	賜	蟻	諾	杜	怒	刊	贈	羽	稍
暑	紗	梅	顙	擡	勸	好	恩	撥	紫
硬	餓	躬	荒	探	詩	莖	亦	冒	奏
予	翁	廉	醬	憐	率	戚	禹	娘	餐
煩	鼻	后	簽	鈴	裁	緒	泊	溜	愈
鳳	幅	巧	詳	淮	膀	朱	薄	柳	盟
腐	袋	紹	壯	恢	臂	晒	膚	鹿	峯
付	黛	陝	儲	佳	牌	授	葛	滾	梯
堤	娜	宰	觸	晉	叛	宇	股	控	爐
爛	厲	尊	獸	姿	浦	艇	嚇	恆	昆

1601	1616	1631	1646	1661	1676	1691	1706	1721	1736
階	釘	藍	伐	屏	鵠	攝	濟	朗	碎
捐	割	療	奶	葡	炎	淑	踐	慮	鴉
嘻	寬	鍊	鬚	懂	誤	裁	欺	稿	蚊
血	藉	晶	拒	廷	搭	污	棄	缸	霸
兇	惜	撤	潛	螺	湯	細	袖	蝗	埋
差	署	沖	卿	灌	吐	貧	駛	舅	犯
潮	愉	售	尋	棵	黏	瓶	扔	浸	潭
翠	緣	剩	緇	赫	龍	滴	芽	稀	粒
疑	堡	租	疏	霍	恭	拖	頁	凶	凹
億	噴	寸	慘	慌	供	盧	尾	趙	鍋
粵	膜	咬	邀	劑	盒	竿	嶼	着	渴
彼	迷	飲	鷹	徑	狠	輝	悲	廚	婚
某	芬	擁	蠅	瞧	尖	患	磨	柔	糾
紡	憤	閑	渤	橡	丈	幾	斗	溶	兼
去	淘	拼	偏	翅	倡	擠	跌	辭	妻

1751	1766	1781	1796	1811	1826	1841	1856	1871	1886
悄	默	映	貞	甄	昏	蠟	徽	雀	碳
湘	貌	袁	吵	殊	混	率	帆	械	萊
胸	廟	丙	乳	澡	郊	背	妨	懸	懶
壽	誕	瑪	醋	先贊	金盤	監	擔	障	問
秤	甸	眠	宿	疫	耀	怡	挑	遲	贛
崇	塘	呆	爺	腰	謂	蒼	腦	獅	郭
涉	賴	膽	惟	厭	岳	巡	露	蛇	躬
壽	毫	躺	奔	紋	拔	秭	狼	沈	寇
蔬	鋸	厲	鍛	澱	餅	朝	卵	岩	夾
皂	址	冠	貪	問	胖	仗	豪	與	揭
遵	愁	凱	吞	腹	碼	億	車車	逼	繳
矮	砂	淺	壘	塗	眉	予	戒	麼	喬
哇	澤	襲	毀	凝	秒	笨	藉	吁	殺
埠	罪	斜	劍	濃	蕩	漂	切	勉	遮
疲	桑	銷	牽	綬	擬	螞	晴	扶	逝

1901	1916	1931	1946	1961	1976	1991
牲	禍	苔	側	腔	貫	艾
獄	肩	蒂	堯	泄	空	妖
譽	聚	坑	窑	削	寂	雁
勃	屈	賀	蛙	芝	祁	螢
碧	虛	壺	違	註	驅	併
漠	綢	祭	倍	巢	渠	澎
貿	薯	駕	沒	扇	罩	憑
伏	塑	蕉	枚	搜	晝	舖
荀	伍	离	逢	霧	仇	漫
托	慰	拳	齡	并	呈	芒
駝	辨	纖	罐	匹	舜	
牢	埔	咸	狂	敏	瓷	
煉	陪	摘	糊	赴	叢	
鬼	慕	睜	慧	兔	寺	
衡	鋒	伴	娟	句	娥	

2001	2016	2031	2046	2061	2076	2091	2106	2121	2136
糞	猜	縹	髓	脂	嚙	混	梧	誓	琉
孵	哀	隴	唉	捨	鈞	蛟	頑	審	蘆
旦	礙	咕	喂	瘦	譚	敲	允	霜	脍
當	遙	虧	淵	塾	啼	遣	斑	爽	枯
叮	宴	捷	扁	縱	屠	傾	磅	曾	澆
砍	娃	捲	販	嫂	哪	循	描	醉	鞠
呵	穩	黔	撫	叟	梨	詢	墓	喔	脅
悔	鞭	霞	謀	昂	栗	彰	榴	埃	誌
儘	綿	哲	嘆	餵	崙	帳	刺	秧	賺
欽	芳	純	累	幣	孤	燭	骼	俘	撞
鮮	賭	數	犁	怖	刮	炒	卷	咚	拆
穴	桐	茲	逵	潘	龜	擾	血	凍	瘡
塵	桶	葬	浩	邁	閤	骸	蝦	溟	饒
垂	訥	灑	驕	茂	侯	夷	蓄	廊	絨
燥	疏	塞	肢	逮	滬	翼	鈔	吏	挨

2151	2166	2181	2196	2211	2226	2241	2256	2271	2286
驚	玲	礎	漆	串	潰	昇	奈	裁	裕
侮	淪	鎚	徒	咱	輯	樞	捩	羲	刁
惡	跨	飾	弓	鑽	疥	豎	撈	析	韻
汪	候	汕	琿	倉	嬌	汝	漏	隙	拌
怨	伙	糟	傢	誼	瓊	吱	瞭	鹵	茅
湧	穫	廁	繭	吾	攜	楹	鈎	徹	蠻
頌	巾	傘	拘	挖	翔	背	旱	盛	范
辯	菊	傲	倦	臥	偵	彬	划	潤	仿
譬	狹	翠	夕	賠	診	柄	鴻	滋	斧
抖	屑	泳	羨	問	柱	闢	稽	措	踢
緞	酵	榜	迅	泌	恥	茫	飢	鄂	拓
騰	閒	畚	帚	縫	醜	瘋	截	偶	陋
託	刑	漂	株	頓	趁	狄	焦	幽	倆
鏈	畜	便	傳	攤	暢	的	艱	豐	蘿
樑	臭	灘	懲	扣	舌	趙	鵲	歪	駱

2301	2316	2331	2346	2361	2376	2391	2406	2421	2436
屢	姪	披	儉	膊	毬	悠	蹄	看	梳
漑	症	蒲	蕭	蛙	繫	瘵	亭	侃	摔
細	囑	樸	轉	萍	玄	羸	吐	瑛	惹
崑	融	殿	斥	饅	旨	蕪	陀	鐸	贊
汗	銓	釘	衰	乏	稚	僞	鈞	么	此
喚	瑟	鮐	嚷	俯	舟	榆	妮	皆	脆
虹	喪	凸	縱	遞	脹	欲	釀	茄	撒
忌	鎖	屯	綜	苔	官	叭	隸	擎	圾
勁	燕	欄	燦	挺	僧	扁	廖	腺	訟
橘	倭	濾	哎	懇	屍	抹	諒	熱	猶
郡	卑	肝	毅	愧	賢	肪	鑼	趾	淹
止	鉤	積	誘	細	蜀	禱	鋁	山	嬰
蹠	傍	櫃	籲	吼	蹤	顛	糕	呖	躍
羞	頗	棍	垣	迴	艘	奠	柑	差	庸
繡	彭	哼	蔔	魂	瓊	蹲	刻	僂	崩



2451	2466	2481	2496	2511	2526	2541	2556	2571	2586
金表	問	州	鋪	沽	鉗	慚	離	頤	喪
膨	崎	隋	銘	菓	券	搓	妒	歉	逸
徧	欠	姨	募	鞏	悉	唯	董	氫	煬
嘛	宵	掩	汜	痕	絃	壩	囂	犬	襪
徧	遜	殷	墳	狐	薛	剝	尿	蟹	婉
瞪	紕	晤	徧	匯	扎	譜	姥	蕈	噲
廿	昭	尉	盜	煌	寨	寞	哩	榨	禦
埖	爪	于	胎	謊	詹	咪	淋	蛛	沅
哩	纏	娛	痰	嚼	杉	鳴	麟	卓	扮
虞	娣	嶽	毳	柬	慎	閤	碌	澈	龐
蛤	參	霄	潼	鹵	漱	沸	跪	辰	脾
乖	耍	崩	呢	立	揉	縫	慨	侍	聘
函	熔	秘	蛭	懼	革	蹈	褲	賤	彌
罕	采	帕	狸	爵	木	逗	憾	馬	塌
嘩	撕	虫	魚	契	跣	亮	精	贊	掬

2601	2616	2631	2646	2661	2676	2691	2706	2721	2736
惱	才	襖	瀕	墮	磯	塞	卜	累	將
束	摺	鞍	沛	倘	唧	梭	琶	蔓	水
哩	債	衙	勑	唾	兢	淋	盼	攔	槩
劣	蜜	耶	剖	累	嵌	哦	研	榴	嚼
氣	馬	治	劈	濫	超	凹	蓬	綠	棲
芥	抄	菸	漂	菱	麴	區	琵琶	掠	琦
矩	矢	莖	翩	攪	朽	啞	蕃	估	竊
俊	參	焰	磨	寡	宙	椰	焚	僱	謙
祈	測	隱	陌	堪	葶	醃	黻	咳	乾
軀	儒	鶯	湄	酷	莎	戍	賦	耒	金
熙	辱	沃	盲	誇	朔	渭	弔	桓	禧
暹	銳	蛹	畝	猴	樂	璃	情	校	息
銜	咎	膊	釜	葫	粽	毓	妥	轎	瞎
旬	佐	鮑	阜	黃	撮	暈	挪	金	歛
蚨	賜	紮	貸	其	蔥	薄	瘡	筋	擲
	穗								

2751	2766	2781	2796	2811	2826	2841	2856	2871	2886
緻	彥	雲	礪	煥	積	聳	圃	虐	匠
兆	盈	模	癆	戟	漳	厄	岷	咯	鯨
陂	穎	牡	聊	檢	杖	藹	妃	莉	其
枕	晤	穆	霖	咀	掙	腴	藩	凌	樵
酬	錫	啡	廬	蠕	濯	誼	汾	麓	薪
蟬	逾	梵	臚	瀉	稠	佑	諷	膏	粘
澄	寓	苻	噶	弦	撐	櫻	馮	朧	苧
任	浴	悼	崗	襄	鋤	蜈	佚	楷	濁
篡	跋	舫	裏	蕪	黍	叨	咐	烤	腫
縹	問	笛	逛	殉	帥	悅	傅	會	錘
僧	弊	抵	蚣	凶	蟀	阪	賣	烘	喘
祿	膀	墊	咖	宅	湊	汴	石	哄	什
樵	捧	檀	魁	着	摧	袍	澱	弘	煞
菴	足	燙	褐	肇	鰓	畔	壇	嫉	梢
崖	僻	撓	菓	紂	嗽	僕	帖	白	珊

2901	2916	2931	2946	2961	2976	2991
恕	薇	垓	鎰	傀	寢	酌
籽	緯	匹	屣	赫	強	灼
鑿	妄	蘋	遡	喝	區	綴
挫	瑜	嫚	禿	夥	蠍	匙
催	曰	氓	儻	渾	懈	飭
粹	猿	蔑	烙	瘡	嗅	渣
吋	詠	渺	攬	鉀	兼	鏹
遂	菠	皿	涿	劫	嚮	雛
嵩	碑	茂	寥	奸	狸	哨
頌	輩	氛	戈	禁	鬚	上
壹	俾	待	辜	謹	潯	
姚	哺	大	拈	俱	粥	
晏	胚	睹	拐	翹	沾	
蔭	裴	舵	圭	囚	璋	
歲	噴	棟	檜	壽	蛙	

3001	3016	3031	3046	3061	3076	3091	3106	3121	3136
冉	邑	傭	媚	逆	攔	春	幟	閨	怡
蕊	噴	蔽	慙	捏	垢	淒	詐	韶	矣
載	堰	緋	睦	鍬	詭	止	沼	善	柚
祠	堇	殯	吩	肋	冠	岐	盞	擅	硯
糙	鳴	秉	忿	苒	龔	膝	蘇	庶	吟
竄	巫	魄	甫	厘	懷	洽	拯	署	瑛
匆	悟	烹	搗	簾	坤	挾	鑄	阮	塢
從	畏	鵬	盪	戀	雀	卸	涿	躁	凹
祀	蔚	屁	澄	磷	惑	硝	衷	卒	旺
噪	宛	頻	諦	樂	燬	嘯	懺	泗	游
誦	挽	頻	磔	龍	藉	掀	敞	散	俞
虫	腕	木	罔	龍	奇	見	逞	遏	喻
山	芋	曝	啣	馬	荊	省	櫛	熬	鬱
貽	轅	謨	汰	侶	鉅	黎	翟	耳	苑
倚	蘊	媒	濤	縷	圈	馬	樵	夷	慰

3151	3166	3181	3196	3211	3226	3241	3256	3271	3286
須	邱	離	滑	攪	霄	刃	撒	武	糜
繡	萬	聲	會	賤	閑	親	騷	窪	瞄
璧	盾	豐	鯨	臣	鉅	唇	鏗	韋	暮
珀	滔	饒	苛	僵	渣	幢	噁	虞	汜
攀	帖	殮	喀	涇	乍	赦	翌	輿	坊
坪	眺	倆	甚	琪	詔	衫	抑	豫	弗
悶	汀	伶	奎	豈	咒	禪	押	峪	怠
莽	沱	嚕	劾	乞	砧	瞬	押	甬	鄧
謎	楠	囉	蒿	伽	樟	鞣	軋	褒	嶺
螟	溺	攏	吭	俏	賡	梓	約	鄙	條
拇	捻	弄	瑚	譚	正	漬	省	滂	溥
敷	懦	履	誨	羌	啄	藻	鑰	傍	硯
拂	糯	合	暨	女	墜	滄	紬	蔴	兌
縛	潤	鈔	桀	暇	撰	廡	咽	瞞	臺
痘	稜	互	礁	呷	扯	肆	齧	蟲	獺

3301	3316	3331	3346	3361	3376	3391	3406	3421	3436
叨	珞	框	皎	蓄	札	邵	毆	豌	靜
洮	瀏	眶	煎	蜻	蚱	肉	藕	愚	哢
蝗	瀘	亥	澗	怯	棚	戎	貳	渝	督
酉	唐	還	隼	昔	輾	孜	掖	御	丘
藤	聾	琥	角	晰	疹	蚤	訝	與	仆
涕	皐	和	歟	昔	貯	鄒	蔭	煜	瀑
蛭	苟	穢	玉	俠	椎	髻	鄧	芭	暴
喃	魴	惶	鈞	諧	叉	砒	燕	鉞	麼
銓	癸	惶	峻	馨	刹	肉	殃	其	沫
勞	棺	譏	鹿	行	嘲	淙	鸚	煥	矛
覽	拱	冀	迄	旭	顛	搔	瑩	庇	蔓
螂	坎	迦	泣	喧	琛	魚	兀	敝	濛
侏	糠	蛭	鞅	軒	丞	蓀	勿	賤	矇
痢	錕	賈	韃	洵	寵	隘	聞	跣	鎰
壠	匡	岬	擒	室	蝨	鼈	章	兵	覓

3451	3466	3481	3496	3511	3526	3541	3556	3571	3586
惘	迭	孽	撩	橄	凰	竝	鏤	亶	曙
砧	疊	寧	鯁	庚	晃	濬	涎	幃	誰
翡	錠	寧	鏐	珪	幾	炯	鏤	竺	蛻
幡	堵	辣	斂	倌	鯽	窘	惺	爪	刃
簪	恫	鑑	琳	汞	巫	悽	腥	擢	軛
倣	曇	瀨	吝	瞋	杰	砌	杏	錐	蠕
楓	弟	檻	鈴	磕	椒	焦	旋	篆	砸
俸	忒	攬	樂	甚	絞	峭	樞	忱	賊
麥	楮	瑯	綸	眈	鉸	虔	滯	猖	竈
孚	頰	悞	侖	伉	矯	倩	質	齣	從
歹	瞳	馬	臚	廓	巢	頤	齋	蟲	綵
陡	鎔	鯉	褻	夔	餞	娶	窄	杓	嘈
氮	根	蒞	鴿	曠	薦	漆	肘	煽	槽
鎗	霓	歷	銘	許	車	兮	雪	呻	舫
綿	匿	礫	丐	槐	絹	琇	瞻	甥	俟



3601 3616 3631 3646 3661 3676 3691 3706 3721 3736

颶	渥	蓓	痲	叨	膿	媾	咳	莖	訣
酥	宛	豹	模	擣	纍	肛	嘿	嫁	罍
崇	玟	辨	殳	兜	灤	梗	濠	頤	緝
餼	刖	畜	致	荳	闌	耿	號	睫	酉
雷	汶	鏑	沫	榴	琅	蝸	皓	界	蝶
懊	枉	陞	鎔	磴	僊	瑰	鎬	菱	權
軼	迂	辟	蒙	沌	僚	觀	徊	害	裙
驛	廕	辟	靡	韜	凜	楷	卉	玖	僖
謁	鈺	徘	冕	膝	廬	坎	餽	疚	蜥
鉤	郁	草	冥	恬	鷺	啃	磧	揀	囂
猷	冤	拚	樊	閔	戀	垮	恍	瑾	効
燕	媛	丕	菜	鈍	鑾	盩	晃	阱	倖
尹	帛	啤	枋	褪	掄	禾	姬	逕	噓
膺	箔	埤	涪	膩	璫	龢	汲	駒	戍
嬰	毫	麼	輻	檸	軋	盪	揖	莒	煦

3751	3766	3781	3796	3811	3826	3841	3856	3871	3886
革化	妝女	說	甦生	蚺	丸	鉞	稟	抹	沐
旋	鍾	榷	唉	研	惋	駁	咭	莓	珐
祗	揅	飪	婆	瑯	隅	跛	杷	昧	扉
炸	盆	孺	瑣	瑤	宛	憊	呖	寐	斐
間	閨	芮	哦	洮	烏	苞	咆	魅	璠
眈	宸	閨	扼	胭	璦	剝	咆	牟	脯
螯	綽	蓉	敖	奄	云	趺	榮	眸	蝮
釗	淳	哉	黯	兩	昀	孖	棚	朦	韃
振	醇	噪	餌	蜒	雍	斃	砌	懵	譚
斬	嗜	憎	詒	妍	躑	婢	毗	萌	憚
甄	奢	圳	沂	胤	佣	嗶	嚙	迷	碭
賑	刪	崔	曳	佯	芭	弼	劈	彌	茗
漲	乘	悴	奕	養	疤	鰵	撇	汨	狄
爭	贖	嗣	蛎	誣	鉢	炳	溥	喵	刁
金	墅	嗇	溢	軀	舶	曷	墓	藐	涸

3901	3916	3931	3946	3961	3976	3991
怙	駙	嵐	囉	肱	骸	錐
靛	素	楞	裸	窠	駭	幌
鼎	峒	荔	酪	尅	蚶	哄
鍍	吶	蝟	鸞	扛	邗	犄
剌	餒	戾	論	夸	軼	鵲
踱	聾	竝	膈	窺	悍	棘
鈍	聳	慄	垓	葵	瀚	惜
孿	涅	漣	淦	曠	撼	几
榻	蒹	熒	梗	匱	畫	頰
袒	撚	稟	蛄	墻	蠖	胛
腔	寧	躡	呱	崆	豁	
棠	癩	聆	聒	紆	踝	
惕	蕾	令	卦	荷	暉	
挑	勞	鱸	渦	和	慧	
涂	嘍	漚	袞	海	蕙	

4001. 4016 4031 4046 4061 4076 4091 4106 4121 4136

竭	風	薺	邪	紉	塚	矗	勝	儉	悚
僥	嘸	憩	馬	醺	啗	婣	碩	族	嘖
姦	岨	鏹	逍	珣	弛	專	甩	淬	鯉
緘	獬	竅	滿	氏	侈	劓	蹂	萃	顙
檻	魚	撻	學	踰	詫	閭	月	琮	呃
諫	噓	仟	岫	拏	掣	仕	壬	驚	噢
潏	涓	秦	癩	赤	攬	弒	茹	颯	拗
噤	浚	覩	餡	斬	禪	狩	褥	澀	鉸
勁	駿	義	斂	楨	孱	跚	紮	掃	氦
薑	婁	屏	翼	朮	產	潛	棗	溯	摠
姜	祺	蓆	悻	茁	鮑	繕	揍	夙	漪
璟	淇	璽	婿	錫	瞠	紳	暫	粟	頤
疽	耆	歙	血	顙	蛭	晌	祚	隧	彝
櫻	魚	汐	恤	轉	蜀	陞	柞	燧	矣
炬	臍	匣	火	椿	杵	笙	睬	荀	淮

4151	4166	4181	4196	4211	4226	4241	4256	4271	4286
堙	瘍	癒	傍	片	蹼	閤	蝠	喋	陶
耶	錫	鴛	甬	卑	蟆	涪	逄	世	癰
咽	快	媛	泚	泚	麼	苜	馥	世	覃
秀	嬰	孕	妣	坏	麼	肥	痞	習	鎗
黝	系	壅	妣	珮	秣	吠	韌	碩	儻
叹	渦	粃	裨	泡	羅	緇	岱	佃	淌
閤	萎	把	復	枰	萬	帆	玳	町	膳
奄	桅	霸	鸞	枇	鎡	玢	讀	鐸	剔
衍	巍	搏	蝙	癖	瑁	舫	單	蹂	媿
焱	諉	其	匾	媿	懋	烽	單	屯	悌
姻	莞	悖	賓	票	懋	跗	啖	燉	兆
茵	綰	扳	鬢	燦	稟	芙	當	冬	窈
寅	雯	坂	摒	瞞	弭	罟	跽	踢	忝
癭	罔	絆	飾	莆	婉	佛	氏	達	枉
鴛	與	笨	耜	菩	根	伏	嫡	苔	町

4301	4316	4331	4346	4361	4376	4391	4406	4421	4436
唾	滴	婁	鸞	尫	告	炕	嗥	麾	闕
湍	惛	螻	慄	疙	褂	骷	昊	諱	畸
囤	倪	搜	蘭	悶	塢	窟	酣	浣	羈
豚	詭	嫺	喃	蒿	榔	澹	斟	突	訖
腎	揠	榔	苓	槁	枊	蕢	邯	瘼	咭
伺	擰	漓	綾	郤	閨	喟	閨	宦	亟
彤	農	離	馬	坭	輒	梱	頤	氛	吃
術	儂	癘	蕞	檻	檜	筐	滹	葷	戕
慟	播	喉	擄	研	鯽	訖	蛄	混	鹿
那	鐺	麗	翠	稈	歲	蝦	餒	莖	繫
捺	羸	振	礮	膚	擗	涸	弧	隍	驥
氛	耒	嘹	問	菰	頰	涸	扈	璜	薊
奴	佬	潦	問	苦	稞	氛	瓠	潢	齊
璫	酪	瘤	寧	賈	圪	壕	華	訢	稷
淖	骨	帘	淋	估	豈	壕	和	宏	珈

4451	4466	4481	4496	4511	4526	4541	4556	4571	4586
漣	菱	蒹	噲	肖	眩	鱣	杼	詒	匙
戛	戡	攬	清	哿	燠	木	過	閭	璽
賈	鍵	雋	璩	休	蟬	湛	拙	悵	折
桔	盡	輦	穹	嫺	巽	榛	拽	楹	蒨
詰	韁	畦	芎	鮮	躑	斟	笑	澂	嫻
謁	旌	綺	晞	覓	祉	朕	忪	馬	羶
誡	菁	卞	曦	金	雉	寧	踵	稱	訕
姣	憬	妾	媳	珣	灸	惇	禿	黠	膳
狡	瘞	禱	徒	邢	查	漲	苦	炊	抒
餃	跼	鞘	遐	昀	轍	硃	餽	陞	姝
楸	揀	阡	砒	酉	聶	茱	叱	釗	澍
垂	沮	鵠	偕	勗	聶	銖	汊	憧	髻
樞	苴	禽	頡	雪	輒	誅	圻	屎	攘
咎	沟	沁	榭	萱	翟	躅	餽	柿	嚙
兼	木	戕	蕭	瑄	胄	渚	澶	噬	若

4601	4616	4631	4646	4661	4676	4691	4706	4721	4736
睿	摸	數	慶	氫	恙	素	醞	哪	据
鎔	疵	參	耦	煒	娖	悃	邕	閔	艸
羈	差	宿	嘔	吃	榮	蓊	魚	鉄	唸
龇	茨	蓑	庵	佞	羸	蕪	她	号	鷄
輜	伺	灘	諳	竊	瀛	畚	牠	尔	群
匝	鱧	窩	盞	杏	漁	或	箇	画	塩
呖	參	憇	痠	鷄	嫵	慾	会	湾	虫
晨	卒	娜	飴	祐	憮	聿	裡	強	邨
聚	蹙	啞	刈	癌	高	埧	著	綫	灯
縉	瘁	愕	詣	偃	歲	釗	妳	攷	响
璽	璵	鶚	次	亢	喂	愿	甚	衛	館
顚	姘	推	縊	饜	維	芸	点	卻	証
族	仁	噉	搥	垠	煒	耘	体	每	葯
嘅	腮	熬	鎰	淫	蜿	筠	總	奥	腳
纂	菟	遨	腋	軼	畹	湟	古	够	簡



4751	4766	4781	4796	4811	4826	4841	4856
寓	牀	沈	疎	帛	領	輶	譚
雙	樓	墻	劑	洒	捆	著	勦
乃	冰	猷	粘	歉	踪	擦	勺
猪	鬪	食	胆	舍	旱	崧	灶
博	鬪	麥	煨	潤	員	咏	粧
丰	烟	壳	劍	涌	諱	覩	鉢
幹	著	輦	磚	陟	狸	忽	毘
啟	況	隄	余	琮	碱	釐	憇
挂	蹟	忻	腊	携	櫻	荒	笋
迪	迹	臺	嚴	耻	妬	呪	
畧	杆	曬	諸	背	卸	脣	
盃	廈	吓	洩	斌	頰	翊	
担	砲	峰	勾	鉤	吊	邹	
金	炮	冲	金	餓	雇	啞	
禾	濕	贖	碍	秀	耽	萱	

# APPENDIX 7

## IDENTIFICATION OF THOSE CHARACTERS WHICH CONTAIN THE SAME NUMBER OF RADICALS

### CONTAINING 1 RADICAL(S)

2	4	5	8	9	11	12	13	14	15	17	18
20	24	28	30	32	34	38	40	41	43	46	50
52	54	58	59	61	62	64	65	66	70	71	75
76	77	81	84	86	93	95	97	98	100	103	104
105	106	107	112	115	125	126	133	135	142	143	147
152	156	158	161	163	165	177	181	183	186	189	190
193	206	211	214	217	220	224	227	228	230	234	235
236	239	241	243	244	248	249	251	256	257	258	268
271	274	277	279	282	287	291	301	302	306	307	319
324	337	348	349	350	355	358	360	362	365	369	376
383	385	386	388	402	403	407	413	415	416	419	422
425	432	440	442	443	458	460	476	481	483	486	494
495	502	515	522	528	532	535	536	537	543	554	559
573	582	583	587	596	600	603	608	611	625	634	637
664	668	678	685	691	693	698	707	725	746	768	774
776	780	781	783	795	806	810	831	836	846	849	858
870	897	899	901	923	932	939	946	967	992	993	994
995	1003	1038	1043	1045	1066	1072	1082	1087	1118	1123	1138
1139	1140	1144	1177	1179	1208	1211	1219	1226	1232	1234	1236
1240	1260	1272	1303	1307	1318	1324	1332	1348	1370	1380	1388
1390	1403	1412	1414	1437	1439	1440	1442	1443	1459	1466	1524
1534	1576	1582	1587	1640	1652	1689	1714	1719	1749	1758	1783
1810	1817	1842	1852	1864	1871	1897	1914	1947	1974	1975	2003
2014	2087	2104	2117	2124	2135	2172	2187	2198	2201	2204	2207
2211	2230	2322	2324	2326	2337	2338	2349	2350	2381	2404	2421
2457	2462	2463	2468	2473	2479	2481	2482	2488	2520	2524	2559
2574	2581	2586	2621	2700	2706	2716	2752	2779	2804	2818	2867
2885	2911	2920	2938	2942	2955	2959	3000	3001	3007	3008	3021
3035	3051	3102	3146	3195	3230	3236	3273	3275	3291	3333	3350
3371	3383	3388	3392	3395	3418	3445	3461	3510	3522	3539	3574
3589	3595	3612	3613	3638	3663	3703	3745	3778	3807	3818	3826
3832	3903	3960	3996	3998	4039	4064	4070	4089	4108	4110	4128
4163	4200	4310	4327	4331	4376	4441	4696	4698	4716	4725	4742
4753	4756	4768	4784	4786	4814						

TOTAL = 402

# CONTAINING 2 RADICAL(S)

3	6	10	16	19	21	23	26	27	33	35	36
39	42	45	47	49	53	57	60	63	67	72	74
79	80	82	83	87	88	89	92	94	96	101	108
109	114	117	119	120	121	122	124	128	129	130	131
132	136	138	141	144	148	150	151	154	157	159	162
164	166	167	168	170	171	172	173	174	175	176	179
180	182	184	185	188	194	196	198	199	201	204	205
207	209	210	216	218	222	225	226	232	237	240	242
245	252	253	262	263	265	266	269	272	273	275	278
285	286	288	292	295	297	299	304	305	309	311	312
313	314	316	317	318	320	326	327	329	330	333	335
336	338	339	340	341	342	343	344	345	351	359	363
366	367	370	374	375	378	384	387	389	393	395	396
397	400	401	406	410	414	417	418	420	421	423	424
426	428	429	430	433	434	436	437	439	441	446	447
448	450	451	455	456	457	459	462	465	466	468	473
474	478	482	485	487	488	489	490	492	493	496	497
500	501	507	508	509	510	512	513	517	518	519	526
530	533	538	539	540	544	547	549	550	556	560	564
565	567	570	572	575	579	584	594	595	601	602	604
606	609	610	613	614	615	616	618	619	620	622	626
627	628	629	633	635	636	638	640	642	644	645	648
650	653	654	655	661	666	667	670	673	674	675	676
679	682	684	690	692	694	695	697	699	700	703	704
705	708	713	714	715	719	720	727	728	730	732	733
736	738	739	741	743	745	748	749	752	753	755	758
759	760	762	763	766	767	769	770	777	778	782	786
788	792	793	794	797	803	804	807	814	816	817	818
819	825	826	827	828	829	833	834	835	838	839	841
842	847	848	851	856	863	864	866	871	873	878	882
883	884	885	887	891	892	893	894	896	903	905	910
915	917	919	921	926	929	930	931	935	936	937	938
941	943	944	945	948	949	951	953	954	955	956	957
960	963	965	966	968	972	973	979	984	985	988	989
990	996	997	999	1002	1005	1006	1007	1008	1010	1012	1019
1020	1021	1029	1032	1035	1036	1040	1042	1046	1047	1049	1050
1052	1054	1056	1057	1060	1062	1063	1064	1069	1075	1080	1091
1093	1094	1095	1096	1097	1098	1099	1100	1101	1103	1105	1106
1107	1108	1110	1112	1113	1116	1117	1119	1122	1124	1125	1128
1129	1132	1133	1135	1137	1146	1150	1156	1158	1159	1164	1165
1169	1172	1173	1174	1181	1182	1185	1186	1187	1190	1193	1196
1197	1199	1200	1202	1205	1207	1216	1217	1218	1220	1239	1242
1243	1249	1250	1253	1254	1257	1258	1259	1273	1275	1276	1279
1280	1281	1284	1286	1290	1293	1299	1300	1302	1304	1306	1309
1314	1321	1322	1326	1328	1334	1335	1336	1337	1338	1339	1340
1341	1344	1347	1349	1350	1360	1362	1363	1364	1365	1366	1367
1368	1371	1372	1373	1374	1377	1379	1381	1382	1385	1387	1392
1398	1400	1402	1404	1407	1408	1416	1417	1420	1422	1424	1425
1426	1427	1428	1430	1431	1432	1433	1441	1445	1447	1449	1450
1451	1454	1455	1456	1457	1458	1460	1463	1469	1470	1471	1472
1473	1479	1481	1483	1484	1489	1490	1491	1494	1499	1500	1505

1506	1507	1512	1513	1516	1517	1521	1523	1528	1532	1535	1538
1539	1540	1541	1542	1546	1547	1549	1550	1551	1552	1554	1563
1565	1568	1569	1573	1575	1578	1579	1583	1585	1590	1593	1595
1600	1603	1604	1612	1613	1614	1615	1616	1621	1622	1627	1628
1632	1633	1636	1637	1638	1639	1641	1642	1644	1646	1647	1649
1653	1658	1666	1668	1669	1671	1676	1677	1678	1680	1681	1683
1685	1687	1688	1693	1696	1701	1703	1705	1706	1708	1709	1710
1711	1712	1713	1715	1717	1721	1723	1724	1733	1735	1737	1738
1740	1741	1743	1745	1746	1748	1750	1754	1755	1760	1763	1765
1766	1770	1775	1777	1779	1780	1781	1784	1785	1786	1788	1793
1796	1797	1800	1802	1804	1806	1809	1812	1815	1818	1820	1821
1826	1828	1832	1833	1835	1836	1837	1838	1847	1849	1850	1853
1855	1857	1858	1860	1863	1867	1869	1878	1879	1880	1885	1887
1892	1894	1895	1901	1904	1907	1908	1912	1913	1916	1918	1924
1927	1936	1939	1940	1942	1945	1949	1950	1953	1956	1957	1962
1964	1965	1967	1970	1971	1973	1976	1977	1979	1980	1983	1984
1989	1990	1991	1992	1998	2000	2004	2005	2006	2007	2010	2011
2012	2013	2017	2021	2022	2025	2026	2029	2032	2033	2038	2040
2041	2044	2049	2051	2054	2055	2057	2058	2059	2062	2065	2067
2074	2080	2081	2083	2085	2092	2099	2101	2107	2108	2116	2118
2120	2129	2132	2139	2140	2144	2146	2148	2154	2160	2161	2170
2177	2178	2180	2184	2185	2189	2190	2194	2197	2202	2206	2208
2212	2216	2218	2220	2221	2225	2228	2229	2232	2235	2236	2237
2239	2240	2242	2244	2245	2248	2249	2252	2253	2256	2260	2262
2263	2266	2267	2268	2269	2272	2273	2281	2282	2285	2286	2287
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4132	4136	4138	4139	4147	4149	4152	4156	4158	4165	4166	4167
4168	4171	4178	4180	4184	4186	4187	4192	4193	4194	4195	4197
4198	4199	4201	4202	4206	4210	4212	4213	4214	4216	4217	4218
4224	4226	4230	4237	4238	4239	4240	4241	4243	4245	4247	4248
4249	4252	4253	4254	4260	4267	4269	4276	4277	4280	4291	4296
4297	4298	4300	4301	4303	4304	4307	4316	4321	4326	4330	4332
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4581	4583	4586	4587	4588	4590	4592	4594	4595	4598	4600	4601
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4861	4862	4864									

• TOTAL = 1863

# CONTAINING 3 RADICAL(S)

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145	149	155	160	169	178	191	192	195	197	202	203
208	212	213	215	219	221	229	231	233	238	246	254
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298	300	303	308	310	315	321	322	323	328	331	332
346	347	352	353	354	356	361	368	371	372	373	377
380	381	382	390	394	398	399	404	409	411	427	431
435	438	444	445	449	452	453	454	461	469	470	471
472	475	477	479	480	484	491	499	503	504	505	506
511	516	520	521	524	525	527	529	531	534	541	542
545	546	548	551	552	553	555	557	558	561	563	566
568	571	574	577	578	580	581	585	586	588	589	590
591	593	598	599	605	607	612	621	623	624	630	631
632	643	647	652	657	660	662	665	671	672	677	680
683	686	688	689	701	702	706	709	711	712	717	721
722	723	724	729	731	734	737	740	742	744	751	754
757	761	764	765	772	773	775	784	789	790	791	796
798	799	800	801	802	805	808	809	812	813	815	820
821	822	824	830	832	837	840	843	844	850	857	859
860	862	867	868	869	872	874	875	876	877	880	886
888	889	890	895	898	900	902	904	906	907	909	911
913	914	918	920	922	925	927	928	933	934	940	942
950	961	962	964	969	970	971	974	975	976	977	978
980	981	986	987	991	998	1000	1001	1004	1009	1011	1014
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1816	1824	1827	1829	1830	1831	1834	1839	1843	1844	1845	1846
1848	1854	1865	1866	1870	1872	1877	1881	1882	1883	1884	1889

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1968	1972	1981	1985	1986	1987	1988	1993	1994	1995	1996	1997
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4170	4172	4175	4176	4177	4179	4181	4182	4189	4190	4203	4204
4205	4207	4209	4211	4220	4221	4222	4223	4225	4231	4232	4233
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4264	4265	4266	4268	4271	4272	4273	4278	4279	4282	4283	4285
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4430	4431	4437	4438	4439	4440	4442	4443	4447	4449	4450	4451
4454	4455	4457	4461	4462	4463	4464	4466	4467	4468	4471	4472
4476	4479	4480	4484	4486	4490	4492	4493	4503	4504	4506	4507
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4527	4529	4530	4538	4542	4544	4546	4548	4549	4557	4558	4560
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4596	4597	4599	4602	4603	4605	4607	4608	4609	4611	4614	4615
4617	4618	4619	4620	4622	4623	4629	4631	4632	4633	4635	4636
4639	4642	4647	4649	4650	4653	4655	4658	4662	4663	4664	4665
4667	4668	4669	4674	4677	4678	4680	4681	4682	4683	4686	4687
4694	4695	4697	4699	4705	4706	4707	4708	4711	4717	4722	4723
4726	4728	4729	4731	4735	4736	4746	4749	4750	4751	4755	4757
4758	4761	4767	4769	4770	4771	4773	4774	4785	4787	4788	4793
4795	4798	4802	4804	4806	4810	4816	4817	4818	4823	4825	4827
4828	4830	4831	4833	4836	4843	4850	4853	4854	4855	4858	4860

TOTAL = 1788

CONTAINING 4 RADICAL(S)

1	7	37	68	85	90	110	127	146	153	187	200
223	247	250	260	267	270	283	296	325	334	357	364
379	391	392	405	408	412	463	464	467	498	514	523
562	569	576	592	597	617	639	641	646	649	651	656
658	659	663	669	681	687	696	710	716	718	726	735
747	750	756	771	779	785	787	811	823	845	852	853
854	855	861	865	879	881	908	912	916	924	947	952
958	959	982	983	1013	1015	1016	1017	1018	1022	1025	1028
1030	1033	1037	1044	1053	1055	1059	1068	1073	1077	1085	1088
1090	1104	1121	1126	1131	1134	1145	1148	1152	1154	1161	1162
1166	1167	1170	1183	1192	1213	1223	1224	1225	1229	1230	1231
1233	1235	1238	1248	1251	1261	1263	1265	1278	1282	1285	1308
1316	1317	1319	1329	1333	1343	1354	1375	1383	1384	1386	1395
1396	1409	1411	1413	1438	1461	1462	1468	1480	1497	1501	1504
1509	1518	1519	1526	1527	1536	1537	1544	1548	1555	1558	1560
1561	1566	1567	1577	1599	1608	1610	1617	1618	1619	1624	1625
1626	1629	1631	1635	1643	1648	1655	1656	1657	1670	1672	1674
1679	1682	1691	1695	1698	1700	1727	1728	1730	1736	1742	1753
1759	1761	1769	1771	1787	1819	1822	1823	1825	1840	1841	1851
1856	1859	1861	1862	1868	1873	1874	1875	1876	1886	1888	1890
1893	1896	1898	1899	1906	1921	1925	1929	1932	1943	1959	1969
1978	1982	1999	2009	2018	2034	2045	2046	2064	2077	2078	2079
2088	2090	2096	2098	2100	2102	2110	2112	2119	2122	2126	2137
2142	2147	2156	2159	2165	2168	2169	2176	2188	2191	2210	2213
2214	2222	2231	2238	2246	2250	2254	2258	2265	2274	2276	2277
2279	2283	2284	2288	2302	2303	2309	2311	2314	2328	2336	2340
2343	2354	2360	2364	2366	2367	2369	2376	2377	2384	2384	2405
2406	2413	2414	2416	2428	2439	2441	2442	2470	2474	2474	2490
2492	2495	2498	2500	2505	2510	2518	2523	2532	2542	2544	2546
2547	2552	2556	2564	2566	2567	2569	2571	2573	2575	2576	2580
2585	2589	2590	2591	2592	2605	2622	2623	2626	2631	2633	2636
2637	2646	2648	2650	2653	2665	2668	2671	2672	2676	2677	2681
2690	2691	2693	2702	2703	2705	2710	2720	2734	2736	2737	2738
2748	2760	2761	2766	2777	2780	2782	2784	2788	2793	2796	2797
2800	2801	2803	2810	2827	2831	2847	2850	2859	2866	2868	2869
2876	2890	2893	2898	2906	2914	2915	2916	2921	2930	2933	2934
2952	2954	2960	2964	2966	2975	2980	2983	2985	2989	2991	2992
3002	3018	3024	3027	3029	3030	3031	3041	3043	3044	3046	3052
3055	3057	3069	3073	3076	3078	3081	3084	3085	3086	3110	3117
3118	3122	3123	3124	3133	3145	3148	3150	3152	3153	3160	3176
3182	3189	3200	3208	3214	3215	3221	3234	3238	3239	3242	3248
3252	3253	3256	3259	3265	3270	3276	3279	3280	3281	3282	3288
3295	3299	3300	3304	3305	3307	3311	3315	3317	3318	3319	3323
3328	3335	3340	3341	3347	3359	3361	3374	3379	3386	3387	3397
3398	3403	3404	3405	3411	3412	3415	3421	3423	3436	3437	3441
3446	3455	3463	3465	3471	3473	3481	3485	3486	3487	3488	3493
3494	3521	3524	3528	3529	3536	3538	3544	3553	3557	3563	3569
3570	3571	3572	3581	3582	3588	3599	3601	3604	3606	3614	3615
3617	3627	3630	3631	3632	3635	3647	3651	3674	3683	3684	3685
3701	3708	3709	3733	3740	3742	3748	3750	3752	3759	3768	3772
3775	3779	3781	3790	3793	3794	3810	3819	3821	3827	3831	3835

3844	3847	3848	3852	3867	3870	3879	3885	3893	3894	3900	3901
3902	3904	3906	3908	3917	3922	3925	3927	3929	3933	3934	3939
3941	3944	3946	3968	3975	3982	3983	3986	3991	3995	4005	4007
4009	4010	4012	4014	4017	4018	4019	4020	4021	4029	4032	4034
4035	4038	4041	4043	4055	4065	4072	4074	4080	4084	4088	4094
4097	4101	4104	4121	4122	4123	4124	4133	4134	4137	4141	4144
4145	4146	4148	4173	4174	4183	4185	4188	4191	4196	4208	4215
4219	4227	4228	4229	4235	4236	4259	4263	4270	4274	4275	4281
4284	4299	4305	4308	4314	4315	4319	4320	4347	4353	4354	4355
4368	4371	4379	4383	4384	4393	4394	4404	4405	4406	4409	4412
4413	4414	4418	4435	4445	4446	4469	4470	4473	4474	4475	4481
4482	4489	4496	4497	4498	4501	4512	4535	4536	4537	4541	4547
4554	4563	4564	4570	4589	4591	4593	4610	4612	4613	4616	4624
4625	4626	4643	4644	4645	4656	4657	4659	4661	4670	4671	4685
4689	4690	4692	4693	4701	4704	4719	4734	4738	4739	4740	4741
4748	4764	4775	4777	4782	4805	4811	4815	4819	4821	4824	4834
4841	4844	4848	4849	4856	4857	4863					

TOTAL = 811

ONE CHARACTER IS COMPOSED OF 2.6 RADICALS AVERAGED OVER THE 4864 CHARACTERS.

ONE CHARACTER IS COMPOSED OF 2.1 RADICALS AVERAGED OVER 753,941 SAMPLES

FOR THE VOCABULARY OF 4864 CHARACTERS.

# APPENDIX 8

## FREQUENCY OF OCCURRENCE OF RADICAL'S POSITION IN THE 4864 CHARACTERS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----

(RADICALS ARE SHOWN IN APPENDIX 1 ON PAGE 90)

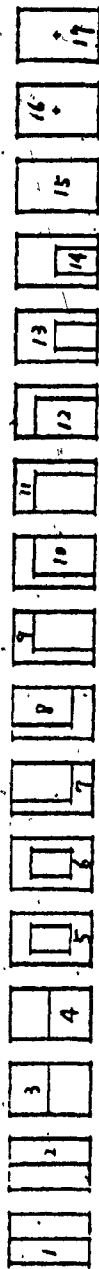
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 TOTAL

TOTAL =

3224 2578 116 162 385 103 151 402 49  
2090 2790 78 61 175 74 123 59 12620

# APPENDIX 9

## PERCENTAGE OCCURRENCE OF RADICAL'S POSITION IN THE 4864 CHARACTERS



(RADICALS ARE SHOWN IN APPENDIX 1 ON PAGE 90)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 TOTAL

TOTAL =

25.55 20.43 0.92 1.28 3.05 0.82 1.20 3.19 0.39  
16.56 22.11 0.62 0.48 1.39 0.59 0.97 0.47 100.00

# APPENDIX 10

FREQUENCY OF OCCURRENCE OF RADICAL'S POSITION OVER 753,941 SAMPLES

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	

(RADICALS ARE SHOWN IN APPENDIX 1 ON PAGE 90)

TOTAL =

336171	269517	20494	25350	36494	16379	14288	231792	2846
210371	310795	9996	11843	19590	4692	9028	30996	1560642

# APPENDIX 11

## PERCENTAGE OCCURRENCE OF RADICAL'S POSITION OVER 753,941 SAMPLES

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

(RADICALS ARE SHOWN IN APPENDIX 1 ON PAGE 90)

TOTAL =

21.54

17.27

13.48

19.91

0.64

0.76

1.62

2.34

1.05

0.92

14.85

0.58

1.99

0.18

100.00